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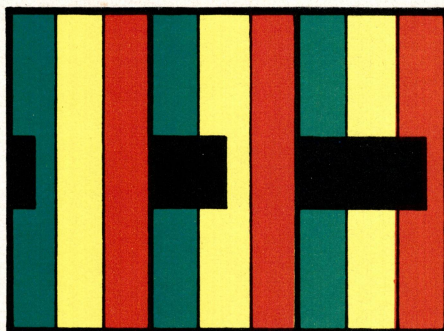
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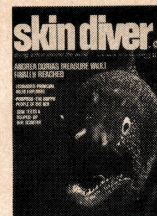


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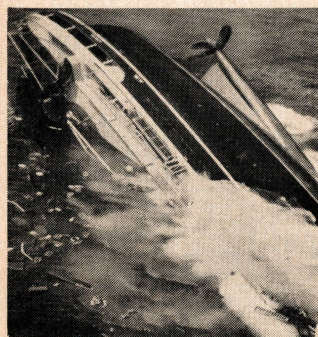
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skin diver

VOLUME TWENTY-THREE NUMBER TWO



50 / Sea People



54 / Doria Adventure



62 / Excessive Deviation

Cover — Carl Roessler photographed this Horned Galapagos moray eel at a depth of 140 feet off Winslow Rocks, part of the Galapagos island chain. Roessler used Kodachrome II film; a Nikon F camera and a 55mm lens in a Niko Mar housing; a Bauer strobe in an Oceanic housing. For more on Galapagos see story on page 94.

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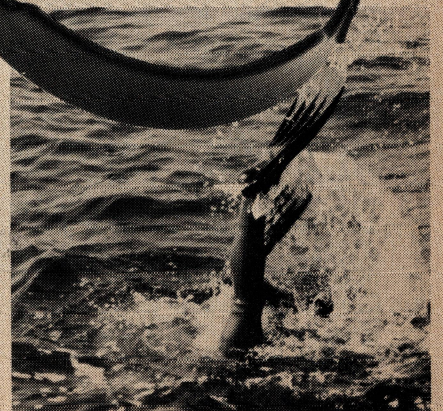
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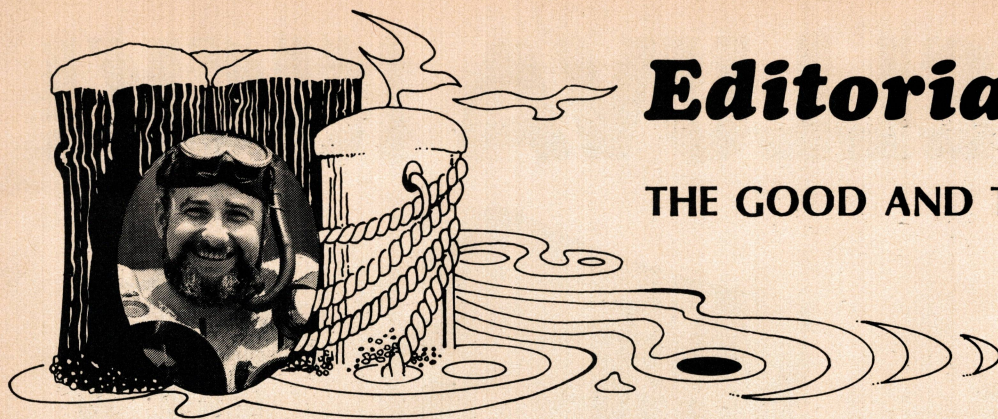
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Editorial

THE GOOD AND THE BAD

By the Publisher

Today's spearfisherman is being attacked from all sides. The conservationists want him abolished . . . the environmentalists want him exiled . . . the commercial lobster fishermen want him outlawed . . . and worst of all, his fellow scuba divers wish he would simply disappear. It no longer matters that he was once diving's supreme hero, for now the spearfisherman has become this sport's downtrodden underdog.

Much of the attack, by conservationists and divers alike, has been well founded. Yes, there has been clear-cut evidence of senseless fish slaughter. There has been wastage, unnecessary killing, and even complete reef wipe-outs. And competitive spearfishing contests, killing just for the fun of it, certainly hasn't painted a very pretty picture of this sport.

But before you cast your personal vote against the spearfisherman, it might be a good idea to take a closer look at what you are about to attack. Let's cut through the clouds of confusion, accusations, and counter-arguments and take a realistic appraisal of "the spearfisherman."

To the casual observer, anyone carrying a speargun is automatically branded as a spearfisherman. No one bothers to inquire about this person's training, experience, or personal philosophy about spearfishing. It's another variation of that age-old syndrome of "they all look alike to me"

It has been my observation during the last twenty years of diving that spearfishermen generally fall into one of four distinct categories.

The Purist — He is the true sportsman of diving. Generally he is in fantastic physical condition, free dives to amazing depths, and can swim for hours on end without ever touching shore or boat. By nature and necessity he is a loner, for all great hunters must pursue their quarry on an individual basis. More often

than not, the purist is misunderstood by his fellow divers because he acts and dives differently. And yet the purist is perhaps the most dedicated naturalist of them all.

Although he may carry a spear, the purist spends most of his time looking . . . and appreciating the wonders of nature which surround him. He only shoots what he needs — perhaps a fish or two for supper. He's very discriminating, selecting just the right size and species of fish which best suits his dining needs. Sometimes he'll go for hours without taking a shot, even though hundreds of fish pass within easy range.

This man truly loves the sea and lives in harmony with nature. He obeys the natural laws of conservation, rather than the inadequate man-made ones, for he knows how delicate the balance of nature really is.

The Neophyte — He is the new diver, full of enthusiasm and laden down with new equipment. He's read a few books, attended basic scuba class, and bought a pile of gear down at the local dive shop. Unfortunately, no one ever bothered to teach him how to use a speargun or how to hunt fish. Maybe he was supposed to gain this knowledge via osmosis.

Armed with only good intentions and the eagerness of a newborn puppy, the neophyte charges out onto the reef to shoot his first fish. He dreams of the triumphant return — the successful hunter with his big fish. Much to his chagrin, the fish don't seem to want to cooperate with his plan. Having made a clumsy entry onto the scene, he's managed to scare most of the choice specimens into hiding. The rest are spooked and far out of his range. After an hour of fruitlessly dashing about the reef, our neophyte becomes tired . . . irritated . . . frustrated . . . and angry. He often ends up shooting an angelfish or some hap-

less creature, simply to prove to himself that he is still a man. It is a sad, pathetic sight . . . and summons a sickening feeling in the heart of any experienced diver.

The neophyte generally abuses the privilege of spearfishing out of sheer ignorance. He was able to purchase a speargun without the slightest bit of training or even warning that training is required. In fact, many neophytes are not even certified divers. Anyone can go into a sporting goods store, department store, marina, or dive shop and simply buy a speargun. Total lack of conscience and control permeates part of the diving business. It is no wonder then, that these speargun bearing neophytes are shunned by dive resort operators, charter boat skippers, and their fellow divers. The neophyte is the biggest problem in spearfishing today.

The Meat Hunter — This man does not consider spearfishing as a sport, but rather as a means of obtaining food. He usually hunts with a scuba tank and a large, powerful mechanical speargun. The fish doesn't have a chance. Since he may only go out once or twice a month, the meat hunter takes as many fish as the law allows . . . and will often fill the boat if there isn't a game warden around to check his catch. His goal is take as much as he can carry, filling the freezer to the brim.

To the meat hunter, shooting fish is a matter of economics. And with the price of food at the supermarket spiraling upward, his desire and determination grows stronger. The meat hunter presents a very real and serious threat to the marine environment, for he is a ravenous consumer without any feeling for the environment which he is destroying. A charter boat load of 20 or 30 meat hunters can wipe out the fish and shellfish life on a small reef.

(Continued on Page 17)



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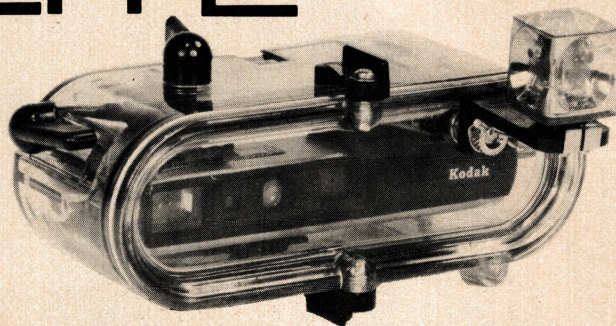
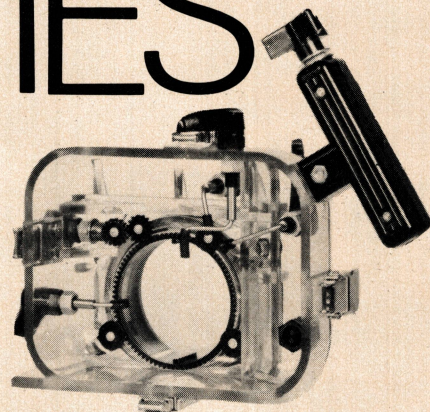
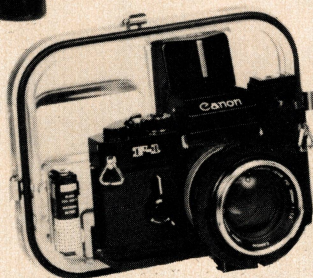
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... I wish to offer a suggestion, both as a scuba diver and as a nurse in the decompression chamber at Virginia Mason Research Center in Seattle, Wash.

Since almost everybody wears a wrist watch, I propose that for purposes of medical I.D. an emblem of the Divers Flag be made available to be placed on the back of watches.

Medical people and police should then be educated and alerted to the meaning of the emblem in the event a diver develops the bends at such a time when he is apart from diving companions and unable to explain his need for a decompression chamber. When this is the case, of course, the time element is very important. If the emblem on a watch served to alert others of the kind of help a diver might need fast, I feel it would be very worthwhile.

ANNE B. RUSSELL

GIG HARBOR, WASH.

... It seems only fair to let you know that I "take heart" every time I look at the picture of Peggy Kelley (Oct. '73). I keep it clipped to my engagement calendar.

It has been a real worry that once I can retire and have the leisure to take diving trips I will be too old. One look, and I'm off for my morning jog!

BETTY PEER

FLINT, MICH.

... I really enjoyed your "Diver's Guide to Bonaire." It contained something I've been looking for for a long time — directions to diving sites that can be reached by swimming from the beach. This eliminates both the hassle of a group tour situation and the expense of a private boat rental or charter. This in turn makes a variety of diving experiences available to more divers.

BRUCE WHITE

URBANA, ILL.

... As a geologist I couldn't help note that in Barada's most recent SDM effort, he describes Cay Sal bank as volcanic ... it isn't. In fact there are no volcanics anywhere in the Bahamas. Gulf Oil Co. drilled a well at Cay Sal bank in the late fifties and encountered 18,000 feet of limestone at which depth they gave up drilling. Oil shows were also reported.

EUGENE A. SHINN HOUSTON, TEXAS

... Permit me to heartily endorse the December, 1973, SDM editorial on all points it touched, and especially in regards to the U.S. decompression tables with emphasis on the fact that these tables were established for men in mental and physical condition. I would also like to state that staying within the limits of your "no decompression limit" gauge is no guarantee that you won't get the bends.

We have treated four cases of decompression sickness in the past two years in which the victims were well within the no decompression limits or pushing near the limits and their gauge indicated no need for decompression. Many variables were also involved, such as age, fatigue, drinking, keeping sloppy bottom time on deep dives, having a "cold."

TAKASHI HATTORI, M.D.

DIVING MEDICAL OFFICER,
CITY OF PACIFIC GROVE
MARINE RESCUE PATROL
AND HYPERBARIC CHAMBER

... I have just read your article in SKIN DIVER on our recent tragic accident. I want you to know how much I appreciate the article which is very factual and well written; also the complimentary remark you made with reference to Clayton and Al.

Factual and well written articles can be helpful, while careless and inaccurate articles can be damaging. What we are trying to do now, and are devoting our main energies, is to build an adequate rescue system which can be taken with us and carried aboard so that we do not have to rely on others which has been demonstrated, unfortunately, not dependable in deep water or in unusual conditions. This can make our future operations safer as well as to be helpful to others, as we all agree we must learn to live with the oceans for our future developments.

ED LINK FORT PIERCE, FLA.

... My job will take me to the island of Sulawesi (Celebes) in Indonesia. I will be there for three years on a nickel processing plant. I would like to do some diving in my time off. Due to weight limits and company policy on shipping personal items I won't be able to take my tanks (all other gear I can fit in). Can someone provide me with information as to: (1) dive shops in Indonesia; (2) dive clubs in the area; (3) books on diving in Indonesia.

PERRY CLARK

328 BIGELOW APT., BIGELOW SQ.
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(Continued on Page 14)

skin diver

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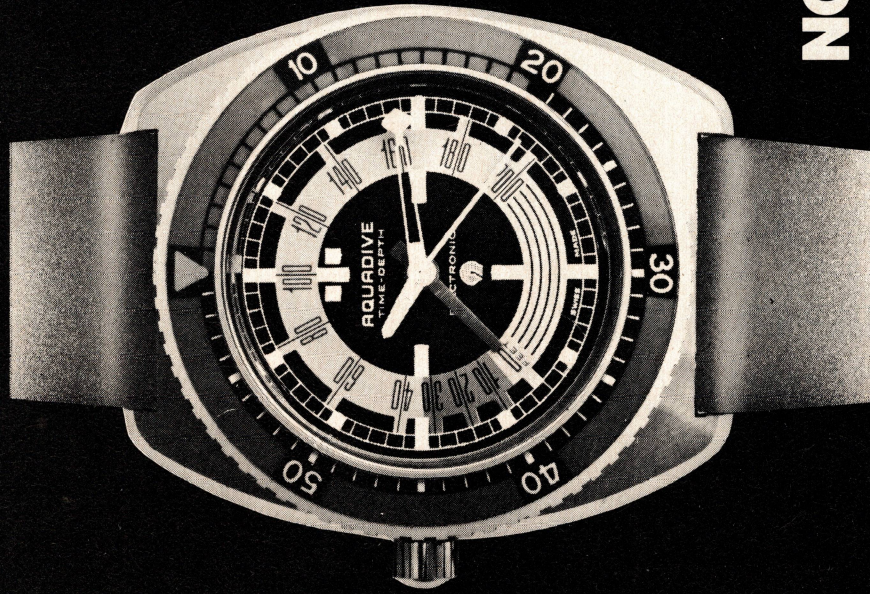
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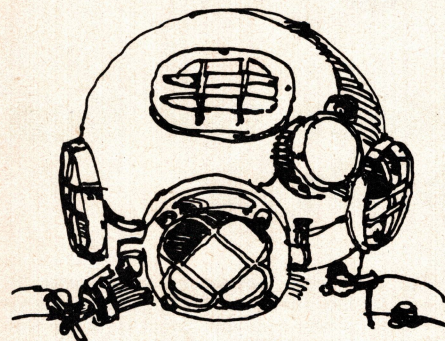
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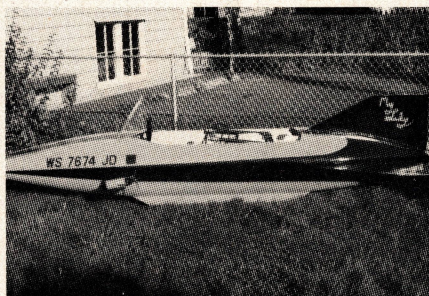
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(Continued from Page 7)

... Here's a photograph of a one man wet type submarine which I recently finished building from my own plans.



It's 11 ft. 6 in. long and powered by two electric trolling motors. The hull is made up of thin wood strips and covered with polypropylene cloth on the inside and outside. The sub carries either single or double 50 cubic foot air tanks for the operator, and a single 72 cubic foot bottle for blowing the ballast tanks, pressurizing the battery box, and supplying an air hose for filling lift bags, etc. It took me 10 months of spare time and approximately \$900.
BRUCE M. PLAZYK CHICAGO, ILL.

Re: Fish of the Month . . . the photographs, drawings, plus text are great and we plan to keep an album to aid in fish identification.

In the October, 1973, issue I believe there is a possible error in the text concerning the rosy rockfish. The text states that it is a member of the family *Scorpaenidae* to which the sculpins also belong. My sources list them as belonging to the same order, but to different families; sculpins belong in the family *Cottidae*. I would sincerely appreciate learning of your sources if they list them as otherwise.
DORIS ALCORN OAKLAND, CALIF.
Reader Alcorn has indeed pointed out a potential source of confusion in the rosy rockfish text. The sculpins do belong to the family *Cottidae*. However, the "sculpin" which the diver most often sees and calls the sculpin is actually *Scorpaena guttata*, a true scorpionfish, but which has been, for some reason, called "sculpin." The less popular name for this fish is spotted scorpionfish, and many ichthyologists prefer to use this name for obvious reasons. The sculpin mentioned in the text refers to this single fish rather than the entire sculpin family . . . Hillary Hauser Anderson.

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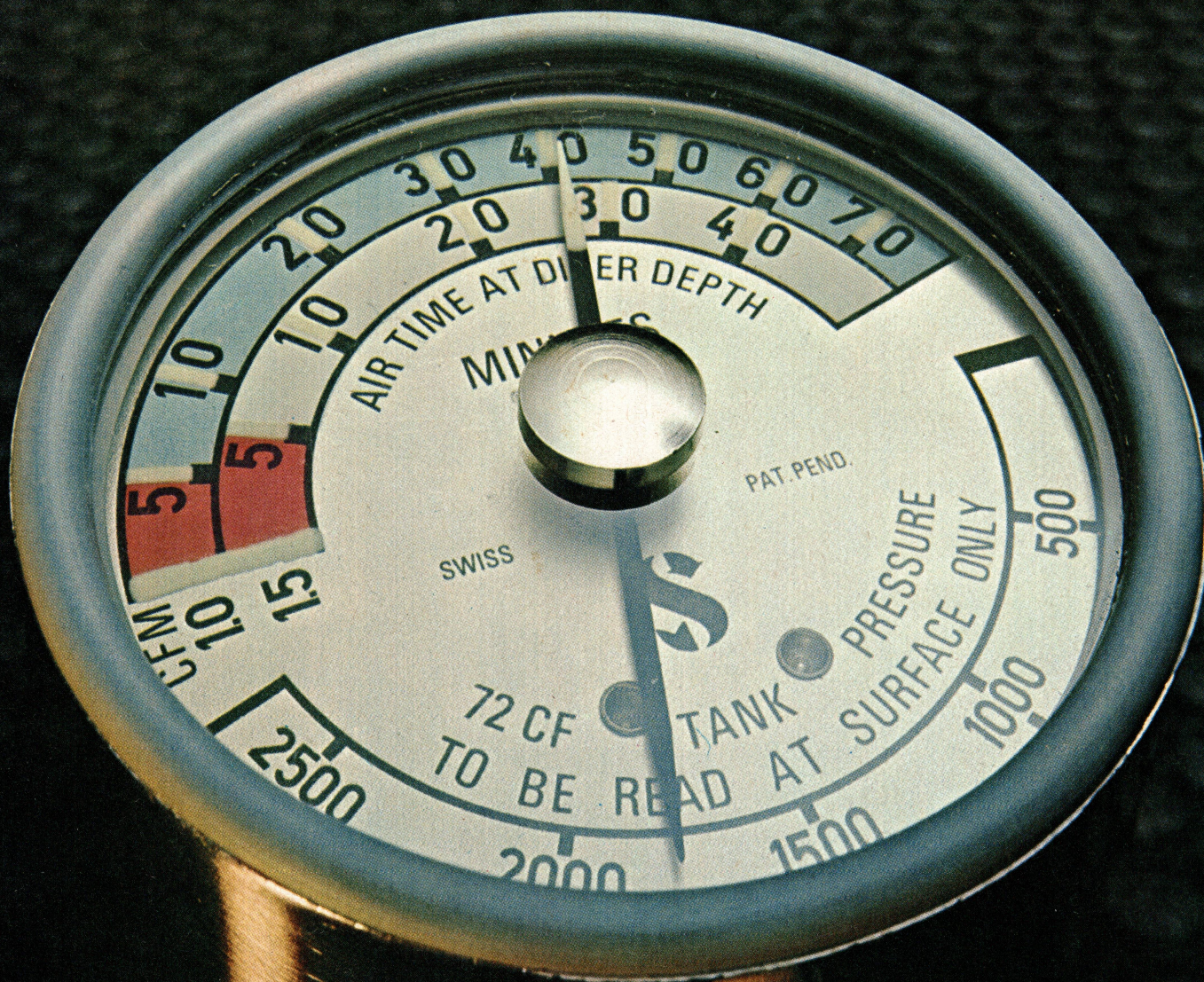
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EDITORIAL

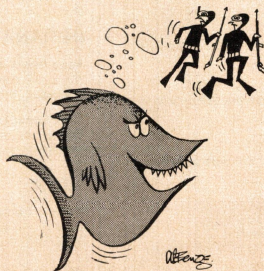
(Continued from Page 4)

Because of the meat hunters, we need fish and game laws for limiting the daily take, and regulations governing the minimum size of fish, lobster, abalone, and other shellfish. But most of all, we need adequate law enforcement for judicious control of these laws and protection of the environment from poachers. Laws are not enough, for most meat hunters would break those laws if they thought they could get away with it.

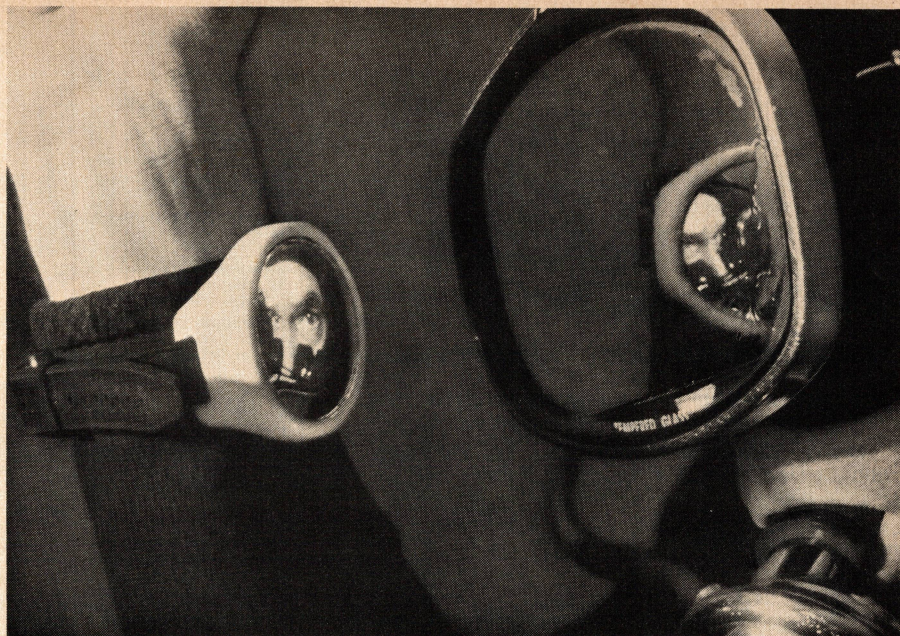
The Super Killer — There is a small, but extremely repulsive, segment of the spearfishing community which enjoys shooting fish for the pure joy of killing. They'll shoot anything that moves — angelfish, grouper, moray eel, manta ray, porpoise, manatee, sea otter, or whatever. Every kill is another thrill and their appetite for this sickness is insatiable. I shall not attempt to analyze the reasons or motivation for this type of performance. It is sufficient to say that such wanton destruction of marine life is absolutely disgusting.

Unfortunately, for the diving fraternity, the super killer is one of the most damaging elements to the sport. It is he who usually shoots the underwater guide's pet grouper, or leaves a pile of rotting angelfish on the hotel dock. The end result: a freshly painted sign which says, "no spearfishing allowed at this resort". One super killer can cause more harm and public condemnation than the good relations built up by a thousand well intentioned divers. Such men have caused local ordinances to be passed prohibiting spearfishing, terribly bitter feuds to flare up between line fishermen and divers, and some of the most severe anti-spearfishing editorials to appear in local newspapers. Super killers make life very difficult for the entire diving community, and yet this same community has made no concentrated effort to curb or control these people.

As you can see, there are two sides to the story. There are the good and the bad. But before we completely abandon spearfishing as an acceptable part of the sport, shouldn't we first attempt to salvage the good and cast out the bad? 



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Mosbarger Co. Dive Shop 8-9
426 Third St.
Eureka, Calif.

National Skin Diving Schools 8-34
1015 El Camino Real
Mountain View, Calif.

National Skin Diving Schools 8-34
3443 El Camino Real
Santa Clara, Calif.

National Skin Diving Schools 8-34
630 Octavia St.
San Francisco, Calif.

Oceanside Divers Ltd. 8-36
240 Harbor Drive, So.
Oceanside, Calif.

Olympic Diver Supply 8-15
2599 North Main St.
Walnut Creek, Calif.

O'Neill Dive Shop 8-27
2222 E. Cliff Drive
Santa Cruz, Calif.

Pelican Dive Shop 8-35
1645 Broadway
Vallejo, Calif.

San Diego Divers Supply 8-6
1214 Rosecrans Avenue
San Diego, Calif.

San Diego Divers Supply 8-6
1084 National Ave.
Chula Vista, Calif.

San Diego Divers Supply 8-6
4004 Sports Arena Blvd.
San Diego, Calif.

San Diego Divers Supply 8-6
7522 La Jolla Blvd.
La Jolla, Calif.

San Jose Divers Service 8-23
2636 The Alameda
Santa Clara, Calif.

Scuba Haus 8-29
2501 Wilshire Blvd.
Santa Monica, Calif.

Scuba Haus 8-29
8160 Sepulveda Blvd.
Van Nuys, Calif.

Scuba Tech 8-28
1613 W. Garvey Avenue
West Covina, Calif.

Scuba Tech 8-28
9422 Alondra Blvd.
Bellflower, Calif.

Sea d Sea 8-16
1911 So. Catalina Ave.
Redondo Beach, Calif.

South Valley Skin Diving School 8-18
3852 Monterey Road
San Jose, Calif.

Sports World 8-25
2477 Huntington Drive
San Marino, Calif.

Stan's Mid Valley 8-26
5350 N. Blackstone
Fresno, Calif.

Stan's for Sports 8-26
28th & F Sts.
Bakersfield, Calif.

Stan's For Sports 8-26
3rd & Grand
San Rafael, Calif.

Stan's For Sports 8-26
1620 Mendocino Ave.
Santa Rosa, Calif.

Stan's Sport Chalet 8-26
3303 North Main St.
Pleasant Hill, Calif.

Tex's Diving School 8-47
910 Wilshire Blvd.
Santa Monica, Calif.

Underwater Schools of America 8-20
1083 No. Harbor Blvd.
Anaheim, Calif.

Underwater Schools of America 8-20
2547 Lincoln Blvd.
Venice, Calif.

Underwater Schools of America 8-20
11501 Whittier Blvd.
Whittier, Calif.

Visalia Scuba Center 8-69
1933 B. W. Caldwell
Visalia, Calif.

Water Pro 8-58
280 Higuera St.
San Luis Obispo, Calif.

CANADA

Aquasport 0-2
223 King Street, West
Brockville, Ontario, Canada

Aquasport 0-2
19 York St.
Stratford, Ontario, Can.

Aquasport 0-2
1175 Provost Street
Lachine, Quebec, Canada

Aquasport 0-2
1187 Hurontario St.
Mississauga, Ontario

Aquasport 0-2
Main Square- 2575 Danforth Ave.
Toronto, Canada

Argonauts Scuba Divers Sch. 0-1
1294 Lauzon Road
Windsor, Ont., Canada

Argonauts Scuba Divers Sch. 0-1
905 Tucumseh RR No. 1
Belle River, Ontario, Canada

Island Divers 0-14
79 Queen St.
Charlottetown, P. E. I. Canada

Nautilus Sports Enr. 0-16
1594 Chemin St. Louis
Quebec, Canada

Pro Dive Store 0-23
500 Esplanade St.
Sydney, Nova Scotia

Russ Reid's Divers Supply 0-13
1347 Kingsway
Vancouver, B.C., Canada

Seaworld 0-3
390 Water St.
St. John's, Newfoundland, Canada

Skin Scuba Schools 0-5
533 11th Ave. S.W.
Calgary 3, Alberta, Canada

Thunder Country Diving 0-12
886 Memorial Ave.
Thunder Bay, Canada

Waterworld 0-7
5246 Blowers Street
Halifax, N.S., Canada

COLORADO

The Aquatic Center 6-8
2616 Verde Dr.
Colorado Springs, Color.

Colorado Divers World 6-0
557 Milwaukee Avenue
Denver, Colo.

Pueblo Sports 6-4
4305 Thatcher
Pueblo, Colo.

DELAWARE

Delaware Diving Academy 2-0
Box 157
Ocean View, Dela.

FLORIDA

Allen's Aquatic & Trail Center, Inc. 3-69
3448 W. University Avenue
Gainesville, Fla.

American Diving Headquarters 3-4
Rt. 1 Box 274-B
Key Largo, Fla.

Aqua Marine Diving School 3-3
1528 S. Washington
Titusville, Fla.

Aquatic Associates, Inc. 3-71
5831 Hallandale Beach Blvd.
W. Hollywood, Fla.

Aquatic Gateways 3-48
15 N. Federal Hwy.
Pompano Beach, Fla.

Boca Marine 3-15
253 N. Federal Hwy.
Boca Raton, Fla.

C & G Sporting Goods 3-14
137 Harrison
Panama City, Fla.

Carter's Sporting Goods 3-13
3001 W. Tennessee St.
Tallahassee, Fla.

The Diving Locker 3-67
295 Sunny Isles Blvd.
Miami Beach, Fla.

Everglades School of Diving 3-6
2668 Davis Blvd.
Naples, Fla.

Everglades School of Diving 3-6
1203 Estero Blvd.
Ft. Myers, Fla.

Florida State Skin Diving Schools 3-16
2652 Atlantic Blvd.
Jacksonville, Fla.

Florida State Skin Diving Schools 3-16
1900 N. Mills Ave.
Orlando, Fla.

Florida Underwater Schools of Diving 3-27
Drawer Z
Port Salerno, Fla.

Frank's Dive Shop 3-60
325 E. Blue Heron Blvd.
Riviera Beach, Fla.

Herb's Dive Shop 3-28
2434 So. Atlantic Avenue
Daytona Beach, Fla.

Holiday Isle Dive Shop 3-50
Overseas Hwy., Rt. 1
Islamorada, Fla.

Ideal Sport Shop 3-73
Stuart Shopping Center
Stuart, Fla.

Key Largo Diving Hdqts. 3-5
Rt. 1, Box 295
Key Largo, Fla.

Key West Pro Dive Shop 3-68
1990 Roosevelt Blvd.
Key West, Fla.

Missile Skin Diving 3-72
431 W. Merritt Island Hwy
Merritt Island, Fla.

Ocean Sports, Inc. 3-59
129 E. Miracle Strip Pkwy.
Ft. Walton Beach, Fla.

P.A.C. Diver's Supply 3-19
1754 Drew Street
Clearwater, Fla.

Polk County Skin Diving School 3-64
717 6th St., S.W.
Winter Haven, Fla.

Robertson Skin Diving Schools 3-58
Court House Square
Marianna, Fla.

Seaview Marine, Inc. 3-54
P. O. Box 525
Long Boat Key, Fla.

Skippers 3-18
408 E. Wright St.
Pensacola, Fla.

Suncoast Divers Skin Diving Sch.
5120 Kelly Rd. 3-2
Tampa, Fla.

Tackle Shack 3-10
7801 66th St.
Pinellas Park, Fla.

Underwater Unlimited 3-12
216 Palermo
Coral Gables, Fla.

GEORGIA

Aqua Shop 3-25
131 E. Montgomery Cross Roads
Savannah, Ga.

Aqua Sports 3-74
Rt. 3 Garrett Rd.
Buford, Ga.

Diver's Den — Ski Haus 3-61
95 Hoyt St.
Athens, Ga.

Dixie Diving Center 3-24
2546 Melville Ave.
Decatur, Georgia

Southern Sports, Inc. 3-30
760 Central Avenue
Hapeville, Ga.

W. Georgia Skin Dvng. Sch. 3-40
2111 Wynnton Rd.
Columbus, Ga.

GUAM

Marianas Divers 0-24
P. O. Box 1116
Agana, Guam

HAWAII

Dan's Dive Shop 9-0
1382 Makaloa
Honolulu, Hawaii

Hawaiian Divers 0-25
P. O. Box 572
Kailua-Kona, Hawaii

ILLINOIS

Aqua Center, Inc. 4-37
717 Morton Ave.
Aurora, Ill.

Aquatic Sports Center 4-18
1703 W. Washington
Waukegan, Ill.

Aquaventure Diving School 4-2
Arlington Park Towers
Arlington, Ill.

Aquaventure Diving 4-2
School O'Hare Inn
6600 Mannheim Rd.
Des Plaines, Ill.

The Twin Fin Diving Center 4-19
R. R. No. 2
Dixon, Ill.

INDIANA

Aqua Den 4-0
705 E. 8th Street
Anderson, Ind.

The Flipper Locker, Inc. 4-40
1924 E. Illinois
Evansville, Ind.

IOWA

Aquatic Center 6-1
2238 W. River Drive
Davenport, Iowa

Diver's Den 6-8
P. O. Box 209
Arnolds Park, Iowa

Iowa State Skin Diving Sch. 6-17
216 Euclid
Des Moines, Iowa

KANSAS

Frank's Dive Shop 5-1
1226 E. Harry
Wichita, Kansas

LOUISIANA

New Orleans Skin Diving 5-2
SCHOOL
4417 Dryades Street
New Orleans, La.

MAINE

Skin Divers Paradise 1-1
RFD No. 3 Turner Road
Auburn, Maine

MARYLAND

Diver's Den 2-25
8105 Harford Road
Baltimore, Md.

Divers World 2-1
8227 Fenton St.
Silver Spring, Md.

The Scuba Hut 2-50
418 Crain Hwy., S.W.
Glen Burnie, Md.

MASSACHUSETTS

Aquapro Dive School 1-5
458 Main Street
West Springfield, Mass.

Boston School of Diving 1-8
1212 Broadway
Somerville, Mass.

Cape Cod School of Skin Diving 1-7
39 Main St.
Fairhaven, Mass.

Eastern Divers Supply 1-15
196 Middlesex St.
Lowell, Mass.

Lakeville Divers Supply Inc. 1-9
Bedford St.
Lakeville, Mass.

Mass. School of Skindiving 1-4
484 S. Main St.
Fall River, Mass.

Merrimack School of Diving 1-12
136 Washington Street
Haverhill, Mass.

South Shore Divers 1-2
511 Washington Street
Quincy Point, Mass.

MEXICO

San Carlos Diving Center 0-18
A.P.D.O. Postal 655
San Carlos, Mexico

MICHIGAN

Aqua Hut Schools of Diving 4-8
1247 Rosewood
Ann Arbor, Mich.

Dive America 4-39
223 W. Superior
Alma, Mich.

Divers Supply 4-7
G-4142 Fenton Road
Flint, Mich.

Michigan Underwater 4-4
School of Diving
1810 E. Michigan
Lansing, Mich.

Michigan Underwater 4-4
Schools of Diving
3280 Fort St.
Lincoln Park, Mich.

Scuba-World-Fun 4-38
26565 John R. St.
Madison Heights, Mich.

Skam! Shop 4-9
5055 Plainfield Ave.
Grand Rapids, Mich.

Sport Chalet & Kalamazoo
Skin Diving School 4-27
4256 Ravine Rd.
Kalamazoo, Mich.

T & E Divers Supply 4-8
2900 Old 23
Brighton, Mich.

West Michigan School 4-28
of Diving
322 S. Hancock, Box 141
Pentwater, Mich.

West Michigan School of Diving 4-28
4496 Dowling
Montague, Mich.

MINNESOTA

Club Scuba 6-10
15802 Wayzata Blvd.
Wayzata, Minn.

Lake Superior Diving School 6-1
3028 W. 3rd St.
Duluth, Minn.

Minnesota School of Diving 6-5
612 Front St.
Brainerd, Minn.

Minnesota School of Diving 6-5
10 Wilson Ave.
St. Cloud, Minn.

MISSISSIPPI

Earl's Dive & Sports Shop 3-26
401 Bouslog Street
Gulfport, Miss.

MISSOURI

Cedar Reef 5-13
Ridgedale, Mo.

Divers Equipment Repair 5-4
& Service
5800 Barrymore Drive
Kansas City, Mo.

John the Diver 5-3
SR 1 Box 459 Indian Pt.
Branson, Mo.

John the Diver No. 2 5-3
1305 S. Glenstone
Springfield, Mo.

MONTANA

Montana Sport Diving School 6-18
41 Kalispell Avenue
Whitefish, Mont.

NEBRASKA

Clemens Mobile Marine 6-19
1620 E. Overland
Scottsbluff, Neb.

Sports Corner Lincoln 6-12
1217 Que St.
Lincoln, Neb.

Sports Corner 6-6
287 Italia Mall
Westwood Shopping Cent.
Omaha, Neb.

NETHERLAND ANTILLES

Oceanic Research Antilles 0-19
P.O. Box 234
St. Maarten, Neth. Antilles

NEVADA

Sierra Diving Center 8-66
P.O. Box 5568
Reno, Nev.

NEW HAMPSHIRE

Atlantic Aqua Sport 1-14
522 Sagamore Rd.
Rye, N.H.

Lakes Region Divers
Supply Hdqts.
RFD No. 3, Weirs Blvd.
Laconia, New Hampshire

NEW JERSEY

Kosell's Home & Sport Center 2-40
3rd & Bay Avenue
Beach Haven, N.J.

Professional Divers, Inc. 2-39
Neptune City Shopping Center
Hwy. 35
Neptune City, N.J.

The Quarry 2-26
Route 517
Hamburg, N.J.

Scuba-Rama Diving Center 2-37
1090 U.S. Hwy 46
Parsippany, N.J.

Sea N' Ski 2-15
246 Main St.
Lincoln Park, N.J.

Underwater Sports of 2-16
New Jersey
Rt. 17
Rochelle Pk., N.J.

NEW MEXICO

New Mexico Divers Supply 8-49
623 Amherst, N.E.
Albuquerque, N.M.

New Mexico School of 8-43
Diving
4101 Cedar Drive
Farmington, N.M.

NEW YORK

B F V Pro Dive Shop 2-45
City Pier
Canandaigua, New York

Central N.Y. School of 2-30
Skin Diving
Rt. 12 Road 2
Norwich, N.Y.

Central N.Y. School of Skin Diving 2-30
1716 Burrstone Rd.
New Hartford, N.Y.

Cougar Sports, Inc. 2-13
3470 Webster Avenue
Bronx, N.Y.

Cove Diving Center 2-38
57 Forest Avenue
Glen Cove, New York

Danziger, Inc. Skin 2-8
Diving School of L.I.
70 S. Main Street
Freeport, N.Y.

Diving Center of Liverpool, Inc. 2-49
504 Old Liverpool Rd.
Liverpool, N.Y.

Marshall's Prof. 2-17
Diving Service
R.D. No. 3
Trumansburg, N.Y.

National Aquatic Service 2-4
1425 Erie Blvd., East
Syracuse, N.Y.

New York State Skindiving Sch. 2-2
P.O. Box 507
Endicott, N.Y.

Northeast Diving Academy 2-41
35 Pershing Ave.
Rensselaer, New York

North Shore Diving Center 2-5
58 Larkfield Rd.
East Northport, N.Y.

South Bay Diving Center 2-48
502 Old Sunrise Hwy.
Amityville, New York

Southern Tier Diving 2-6
209 Hoffman St.
Elmira, N.Y.

Staten Island Diving College 2-46
7423 Amboy Rd.
Staten Island, New York

NORTH CAROLINA

Aqua Haven 3-62
2927 Essex Circle
Raleigh, N.C.

Aqua World, Inc. 3-36
5425 Wrightville Avenue
Wilmington, North Carolina

E J W Bicycle & Sport Shop 3-51
2204 Arendell St.
Morehead City, N.C.

North Carolina School 3-20
of Diving
2313 Randleman Road
Greensboro, N.C.

North Carolina School 3-20
of Diving
124 S. Main St.
Spring Lake, N.C.

Underwater Sales & Eng. 3-52
P.O. Box 765, N.
Wrightsville Beach, N.C.

Underwater Sports of North Carolina 3-70
P.O. Box 869
Jacksonville, N.C.

Underwater Unlimited, Inc. 3-41
2704 Tuckaseegee Rd.
Charlotte, North Carolina

OHIO

The Aqua Shack, Inc. 4-41
440 E. Dixie Drive
W. Carrollton, Ohio

Aquarian Diving Center 4-35
P.O. Box 175
Rogers, Ohio

Aqua Sport Enterprises 4-13
2508 Atco venue
Middletown, Ohio

Buckeye Diving Schools 4-12
694 Broadway
Bedford, Ohio

Central Ohio School 4-14
of Diving
3487 N. High St.
Columbus, Ohio

Chafee's Marina 4-17
2707 N.E. Catawba Rd.
Port Clinton, Ohio

Dive, Inc. 4-23
R.D. No. 6
Mansfield, Ohio

Ke Puka Wal Dive Shop 4-15
4049 Lincoln Way E.
Massillon, Ohio

Ohio Underwater Schools of Diving 4-16
29006 Lakeland Blvd.
Wickliffe, Ohio

Salem School of Scuba 4-31
405 E. State St.
Salem, Ohio

OKLAHOMA

Dive Shop 5-29
1349 W. Reno
Oklahoma City, Okla.

Gene's Aqua Pro 5-28
Rt. 1, Box 324
Ft. Gibson, Okla.

Oklahoma Divers Supply 5-18
909 Q. Street, S.W.
Ardmore, Okla.

Oklahoma Schools of Diving 5-6
3118 S. Sheridan Rd.
Tulsa, Okla.

Underwater Sports Shop 5-19
2533 N.W. 10th
Oklahoma City, Okla.

OREGON

Cap'n Frogs Swim 7-9
& Dive Shop
206 N.E. Jackson St.
Roseburg, Ore.

Deep Sea Bills 7-1
P.O. Box 213
Newport, Ore.

Northwest Divers Supply 7-3
852 S. Broadway
Coos Bay, Ore.

Northwest Divers Supply 7-3
1677 Coburg Rd.
Eugene, Ore.

Scuba Unlimited 7-25
15705 S.E. McLoughlin Blvd.
Milwaukee, Ore.

Trans-Global Divers 7-18
5405A North Lagoon Ave.
Portland, Ore.

Valley Scuba Center, Inc. 7-19
10803 S.W. Barbur Blvd.
Portland, Ore.

PENNSYLVANIA

Atlantis Diving Center 2-18
4363 Main Street
Philadelphia, Pa.

B & B Marine Specialties 2-20
P.O. Box 277
Hillsville, Pa.

Gilligan's Isle, Inc. 2-36
6545 Roosevelt Blvd.
Philadelphia, Pa.

Lake Erie Diving School 2-2
405 W. 8th St.
Erie, Pa.

PUERTO RICO

Mir Suau & Co. S. En C. 0-9
V.O. Box 3025
Mayaguez, P.R.

RHODE ISLAND

Rhode Island Academy 1-6
of Skin Diving
111 Bellevue Avenue
Newport, R.I.

Rhode Island Academy 1-6
of Skin Diving
209 Elmwood Ave.
Providence, R.I.

SOUTH CAROLINA

Neptune Dive & Ski Inc. 3-21
P.O. Box 6725
North Augusta, S.C.

South Carolina School 3-39
of Skin Diving
4357 Jackson Blvd.
Columbia, S.C.

South Carolina School
of Skin Diving 3-39
2247 Augusta Rd.
Greenville, S.C.

SOUTH DAKOTA

Coral Reef Scuba Shop 6-20
1113½ S. Minnesota Ave
Sioux Falls, S. Dakota

TENNESSEE

Aquatics, Ltd. 3-56
4110 Gallatin Rd.
Nashville, Tenn.

Dive Shop 3-23
P.O. Box 8007
Memphis, Tenn.

Skindiving Schools of Chattanooga 3-63
5708 Lee Highway
Chattanooga, Tenn.

TEXAS

The Dive hop 5-12
2719 Live Oak Street
Dallas, Texas

Gulf Sports 5-10
1923 61st St.
Galveston, Texas

Houston Scuba Academy 5-17
13628 Alameda Road
Houston, Texas

Houston Scuba Academy (West) 5-17
10134 Long Point Rd.
Houston, Texas

J. Rich Sports Ltd. 5-9
1340 Galleria Mall
Houston, Texas

J. Rich Sports, Ltd. 5-9
2367 Rice Blvd.
Houston, Texas

School of Scuba 5-16
1009 Walnut St.
Abilene, Texas

Skin Diving Schools 5-8
of Fort Worth
3813 Southwest Blvd.
Fort Worth, Texas

Texas Divers Co. 5-21
1943 N. New Braunfels Avenue
San Antonio, Texas

Texas Divers Co. 5-21
Fm. Rd. 306 at Canyon Dam
New Braunfels, Tex

Texas Skin Diving Schools 5-27
4320 N. Lamar
Austin, Texas

Texas Skin Diving Schools 5-27
Intersection 2222 Hwy 620
Austin, Texas

Texas Skin Diving Schools 5-27
803 N. 2nd St.
Killeen, Texas

Trident Diving Equipment 5-7
2110 West Avenue
San Antonio, Texas

U.S. VIRGIN ISLANDS

Aqua Action 0-20
Wimberg Peak
St. Thomas, Virgin Islands

Virgin Islands Diving Schools 0-21
P.O. Box 1704
St. Thomas, V.I.

UTAH

Day's Diving Den 8-71
156 S. 400 E.
Orem, Utah

USAFECO Diving School 8-41
1908 Washington Blvd.
Ogden, Utah

USAFECO Diving School 8-41
727 S. West Temple
Salt Lake City, Utah

Wolfe's Sporting Goods 8-45
250 So. State Street
Salt Lake City, Utah

VIRGINIA

Martens & Davis Diving Shop 2-23
5107 Colley Avenue
Norfolk, Va.

Ski & Dive Shop Inc. 2-32
1545 N. Quaker Lane
Alexandria, Va.

WASHINGTON

Allied Diving Center, Inc. 7-21
N. 6821 Division
Spokane, Wash.

Aqua Masters 7-27
201 Meridian, North
Puyallup, Wash.

Aquarius Skin Diving School 7-26
20801 Hwy 99
Lynnwood, Wash.

Chelan Divers Supply 7-15
South Lakeshore Drive
Chelan, Wash.

The Dive Inn 7-6
1105 Fruitvale Blvd.
Yakima, Wash.

Divers Hut 7-16
4831 Arsenal Way
Bremerton, Wash.

Everett Skin Diving Schools 7-14
3515 Broadway
Everett, Wash.

Northwest Divers 7-20
2720 W. Maplewood
Bellingham, Wash.

Northwestern School of Skin Diving 7-5
2123 No. 30th Street
Tacoma, Wash.

Scuba Supplies 7-13
738 Marine Drive
Port Angeles, Wash.

Sea Anchor 7-4
234 Mission St.
Wenatchee, Wash.

Silent World Divers, Inc. 7-24
14444 Sunset Hwy.
Bellevue, Wash.

Washington School of Diving 7-23
7819 Aurora North
Seattle, Wash.

Whidbey Divers Shop 7-28
P. O. Box RR 80 N.W. & 900 W.
Oak Harbor, Wash.

WISCONSIN

Sea N' Ski 4-24
4248 No. 76th
Milwaukee, Wis.

Sea N' Ski 4-24
Brookfield
Wisconsin

Sea N' Ski 4-24
Fox Point
Wisconsin

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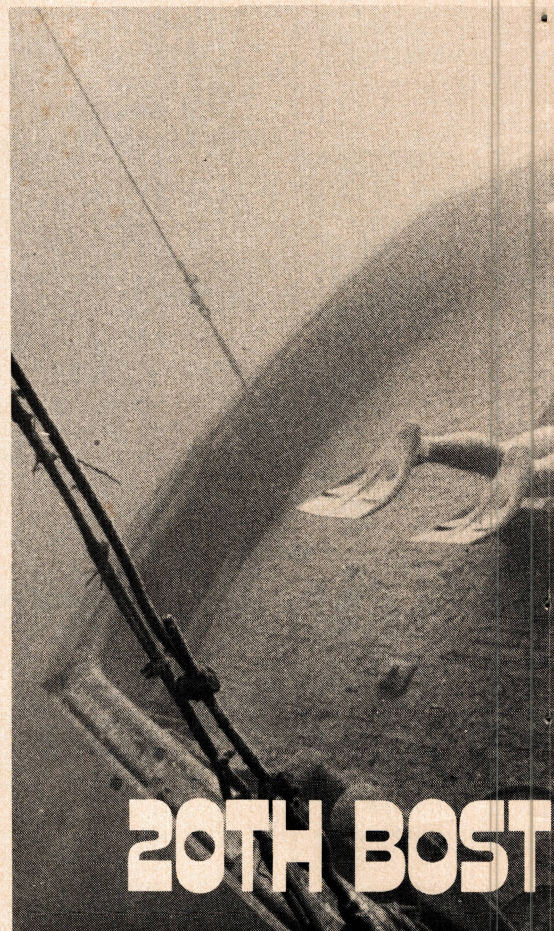
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thing you really want.

They've come a long way. Starting in the cellar of the Boston YMCA in 1955, the Boston Sea Rovers' idea was not to raise money, but rather to raise the level of knowledge of the underwater world. This purpose has never changed and the Sea Rovers' clinics have been the model for all the underwater gatherings that have followed throughout the country.



20TH BOST

At first the clinics were just evening shows with some speakers and movies, but as more talent became available, the club decided to have seminars during the day. The seminars were an immediate hit and became a permanent part of the clinic, as they allowed the presentation of solid scientific data that the serious diver wanted. The evening show became the frosting on the cake; the entertainment part of the program.

The number of Sea Rover firsts is impressive. In 1958, they were the first to present Jacques-Yves Cousteau to an American diving audience, and he's returned many times as a Sea Rover club member. Another first was the presentation by Dr. George Bond of the first proposal to a sport diving audience of habitat living and saturation diving in 1960. That was advanced thinking at the time, and few in the audience grasped the magnitude of the idea, but we all know what happened in the next ten years.

The list of firsts goes on and on, but the most important thing the Rovers have done is to bring on their platform the entire underwater world. It's almost impossible to name anyone who's done anything of importance underwater who has not appeared on their platform. This year, their twentieth, will be extra special. Dr. Joseph MacInnis will premiere a



ON PARTY

new film. Dr. Eugenie Clark will talk about her latest work in the Red Sea, and David Doubilet will show the photos he took with Dr. Clark. Brad Luther, the best local wreck man, will tell of his local finds. Jack McKenney, editor of SKIN DIVER, Doc Edgerton, Ralph Shamlian, and many other special guests will attend. There'll be seminars in all fields — archaeology, photography, fish, habitats, cave diving, equipment of the future — you name it and there'll be an expert on it there.

The clinic will take place March 9 at Boston University, Sherman Union, Commonwealth Ave. at 10 a.m. The evening show will be at the John Hancock Hall at 8 p.m. Tickets for the two are \$6. Meet the speakers at the Laugh-In party at 11 p.m. after the show — open bar — \$5. Ticket chairman is Robert Newberry, 10 Fitz Terrace, Chelsea, Mass. 02150. Telephone (617) 884-2355.

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February 9

16th Illinois Council Annual Awards Dinner Banquet & International Photographic Competition Exhibition, Sheraton Chicago Hotel. (Contact: Betsy Riley, 2125 N. Humbolt, Chicago, Ill.)

February 15

3rd Aquamondo lecture, The American Exploration and Habitation of the Seas, Chicago Academy of Sciences, 7:30 p.m. (Contact: Aquamondo, Inc., 666 Lake Shore Dr., Chicago, Ill. 60611)

February 18-23

West Michigan Sportland Boat Show, Civic Auditorium, Grand Rapids, Mich.

February 23

Planet Ocean symposium and film festival, Stony Brook University, Long Island, N.Y. (Contact: North Shore Diving Center, 58 Larkfield Road, East Northport, N.Y. 11731)

March 2

Your Future in the Sea '74, Hunter College, New York City. (Contact: American Littoral Society/Symposium, 33-38 164th St., Flushing, N.Y. 11358)

March 8

California U/W Film Exposition, Anaheim Convention Center, 8 p.m. Exhibits, 3-8 p.m. (Contact: California Underwater Exposition, P.O. Box 10931, Santa Ana, Calif. 92711)

March 9

20th Boston Sea Rovers Clinic. Seminar, Boston University; evening show, John Hancock Hall. (Contact: Robert Newberry, 10 Fitz Ter., Chelsea, Mass.)

March 15

International Photo Competition deadline, Pacific Science Center, Seattle, Wash. (Contact: Competition, 6531 N.E. 198th St., Seattle, Washington)

March 23-24

Man in the Sea Symposium, Pacific Science Center, Seattle, Wash. (Contact: Symposium, 6531 N.E. 198th Street, Seattle, Washington 98155)

April 6

Underwater Symposium, Harvard University, 11 a.m.-4 p.m. Film Review, John Hancock Hall, 8 p.m. (Contact: Fred Calhoun, P.O. Box 291, Back Bay Annex, Boston, Mass. 02117)

April 20

Underwater Film Review, Columbia University, New York City, 1:30 p.m. (Contact: Fred Calhoun, P.O. Box 291, Back Bay Annex, Boston, Mass. 02117)

May 3-5

Our World/Underwater, Sheraton-Chicago Hotel and Medinah Temple. (Contact: Joyce Markstahler, 6222 N. Cicero Ave., Chicago, Illinois 60646)

September 21

Underwater Film Review, Fall Edition, John Hancock Hall, Boston, Mass. 8 p.m. (Contact: Fred Calhoun, P.O. Box 291, Back Bay Annex, Boston, Mass. 02117)

SATURATION TRAINING

The Divers Institute of Technology, Seattle, Washington, has added "Saturation Theory and Techniques" to their curriculum, which will lengthen their program from 14 to 17 weeks. The knowledge obtained from this new course is designed not only to assist the graduate in the field of diving, but to make him aware of the future potential of commercial diving in the deep work on the continental shelf and in areas of hydro-electric dams and lakes where diving has been impractical because of the duration of surface-supplied dives.

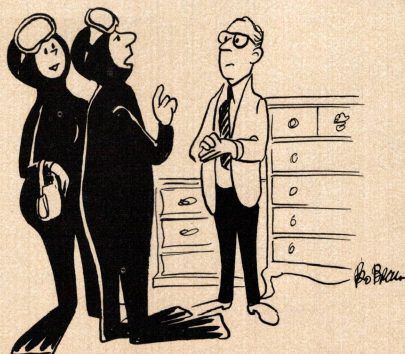
The institute has the technical ability to teach this relatively new technique in diving, and is looking forward to enrolling its first students in the new program. Further detailed information may be obtained by writing to: Divers Institute of Technology, Inc., 1133 N.W. 45th St., Seattle, Washington 98107.

AQUAMONDO LECTURES

"The American Exploration and Habitation of the Seas" is the theme of the Aquamondo lecture to be given Friday, Feb. 15, 1974, at the Chicago Academy of Sciences. Conrad Kleveno, of the United States Environmental Protection Agency, will be the guest speaker. The lecture will feature films on the Sealab and Tektite projects, accompanied by a slide-lecture on Tektite by Kleveno. A film on Great Lakes pollution, *Project Hypo*, will also be shown.

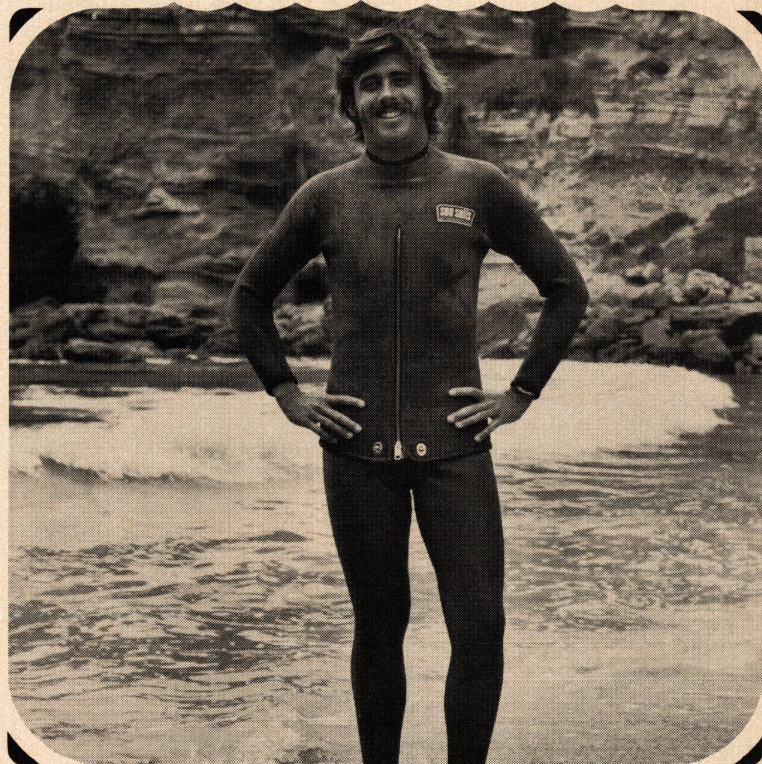
Monthly programs such as this are sponsored by Aquamondo, Inc., at the Academy and the Shedd Aquarium. All agenda are geared toward divers, and feature renowned underwater explorers and scientists. All receipts are donated to recognized Chicago educational institutions. Admission fee is \$2. Tickets may be purchased in advance through the Chicago Academy of Sciences, 2001 N. Clark St., Chicago, Ill. 60614; or from Aquamondo, Inc., 666 Lake Shore Dr., Chicago, Illinois 60611.

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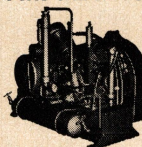
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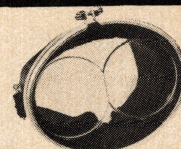


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Faster Than A Speeding Bullet...

***An Exclusive SDM Test Report On The Farallon
Mark VI Diver Propulsion Vehicle*** **By Jack McKenney**

Faster than a speeding bullet? Well, not quite, but that's the impression you'll get when you mount a Farallon Mark VI Diver Propulsion Vehicle and blast off into the enchanting world of innerspace! Recently, Ralph Shamlan, the pace-setting young president of Farallon Industries, Rob Johnson, and I ran over to Catalina Island with Tom and Lynn Ebro in their new 28-foot Sea Ray to test a Mark VI DPV. Ralph also brought along a Mark V unit so that two divers could always travel together underwater.

When I reported on the Farallon DPVs Mark I, II, and III in the October, 1971, issue of SKIN DIVER, I stated, "... don't assume that using one of these machines is like strapping a 60 hp engine onto your bod and tearing off through the kelp at mask-ripping speeds. The machine isn't designed to work that way. It merely pulls the diver along at the same rate of speed as a strong diver who is pouring it on with a large pair of fins."

Times have changed! At that time the Mark II and III machines would top out at around 2.5 mph underwater. The Mark VI unit, initially designed for military application, will peak at a fantastic 3.7 mph! The strongest diver with the most powerful fins certainly can't match that speed.

The familiar, bright orange Mark II, III, and IV, DPVs, which have made pretty impressive inroads in the diving market over the past three years, are held out in front of the diver and steered with both hands. The much more powerful Mark V and VI are straddled, with the diver's fanny resting against a T-bar attached to the kort nozzle (propeller shroud). The diver lays on top of the Mark VI and steers the unit with his entire body making maneuverability much easier.

We dropped the units into the water, straddled them, turned the switch to fast, squeezed the dead-man's trigger on the right front handle, and flew off through the towering kelp. My first impression was that the age of underwater flight had finally dawned! The feeling was one of utmost exhilaration and I have to count that dive as one of the most fun dives I have ever made.

Ralph and I emerged from the kelp bed and leveled off on a sandy bottom. We were running a compass course due east into deep water. (The gauge panel attached to the carrying handle of the DPV had a compass and depth gauge mounted on it and was situated just right for direct eye contact.) I skimmed over the bottom, chased a flounder, executed a loop and then leveled out with a roll. I twisted the machine at sharp right angles, dived for the bottom and instantly applied the brakes by releasing my grip on the right handle. It handled superbly! I felt as free and unencumbered as Jonathan Livingston Seagull. And I found by straddling the Mark VI it was an easy matter to control the unit by just holding on with one hand.

All this time I had been running at full variable thrust of 70 pounds. By turning the speed switch to off, the speed controller is bypassed and a full 48 volts is directed into the motor giving the machine 90 pounds of thrust. I decided to try it. I mounted my trusty steed, turned the switch — and this time I really moved! The only time I had ever experienced traveling so fast underwater is when I was tow sledding behind a boat. I ran full power for about five minutes, stopped the Mark VI and set it on the bottom. I then swam out for 30 feet under my own power. I couldn't believe it. It felt as though I had lost my fins — the difference was truly amazing!

The Mark VI, which measures 51½" long by 8" in diameter, consists of two aluminum cylindrical cases joined by six stainless steel twist lock snaps, sealed against an O-ring. The front section is the battery case containing two battery packs and the underwater lamp. The rear section is the drive case containing the electric motor, drive components, controls and catalyzers. (Catalyzers are vitally important in any closed atmosphere where batteries are being used because the electrical system gives off hydrogen and oxygen gas, which when combined, is explosive. The two catalyzers installed on the forward bulkhead of the drive case changes these gases to water vapor eliminating any chance of explosion.)

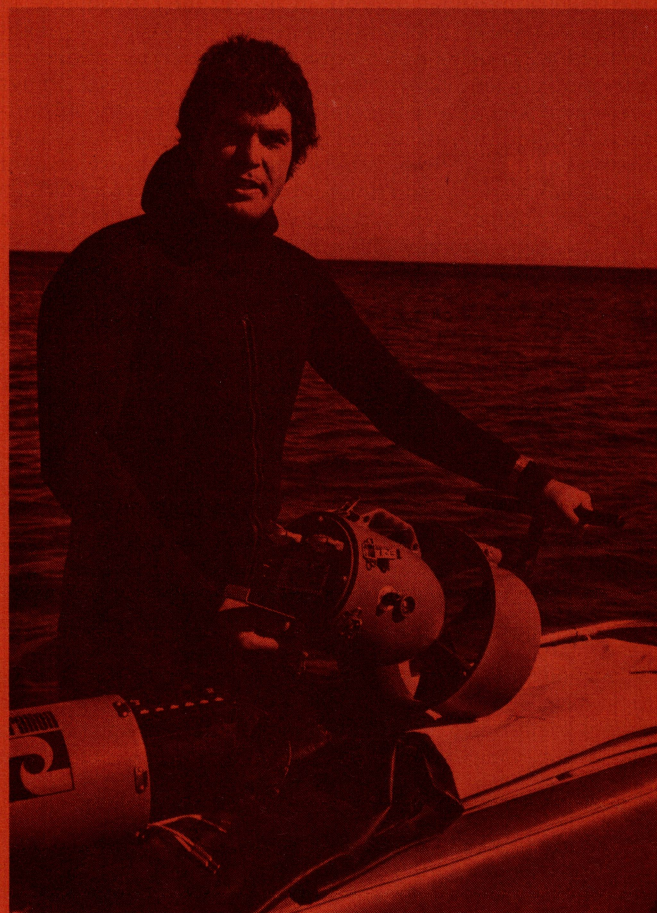
The housings are made of 6063-T6 marine aluminum and Tensaloy aluminum alloy. They are then anodized and finished with a handsome, bright international orange polyurethane. The one and a third horsepower ball bearing, permanent magnet motor is made exclusively for Farallon and was designed specifically with the DPV application in mind. The three bladed, ten inch diameter propeller is made of Tensaloy aluminum, hard

anodized, coated with black urethane and is two and a half inches larger in diameter than the props on the Mark II, III and IV DPV's. Mark VI weighs 85 pounds out of the water. There are two lead weights in each of the two battery packs totaling four pounds, allowing for buoyancy adjustment. Optimum buoyancy in salt or fresh water is about a half pound positive. I sometimes like to run the DPV just slightly negative, so that I can lay it on the bottom if I want to get off and work or photograph something.

Four 12-volt, 14-amp/hours motorcycle-type batteries, connected in series to provide 48 volts, power the Mark VI. The power and head lamp controls are sealed magnetic reed switches and the 109,000 candlepower, 12-volt lamp is mounted into the front end of the machine. A rotary dial solid state speed control adjusts the machine for variable power from 10 to 70 pounds of thrust, or 90 pounds at fixed speed. A spring loaded dead-man switch on the right handle controls the power. The two-battery packs are contained in moulded electrolyte resistant cases. The lids of the cases are removed when the batteries are installed in the DPV. When traveling, the lids are replaced and taped on the cases and the battery units are like pieces of luggage with webbed nylon handles. From a fully discharged condition, charging time is four to five hours.

After charging the batteries, the machine can be put

Ralph Shamlian, inventor/manufacturer of Farallon DPV.



together and ready for use in about one minute. Both battery cases are simply inserted into the front end of the DPV, two sets of wires are plugged in (one set for the lamp and one set for the motor), and then the machine is closed up and clamped shut. The only maintenance required is that the batteries should be kept clean, the O-ring should be lubricated and free of sand and grit, and the machine rinsed with fresh water after use.

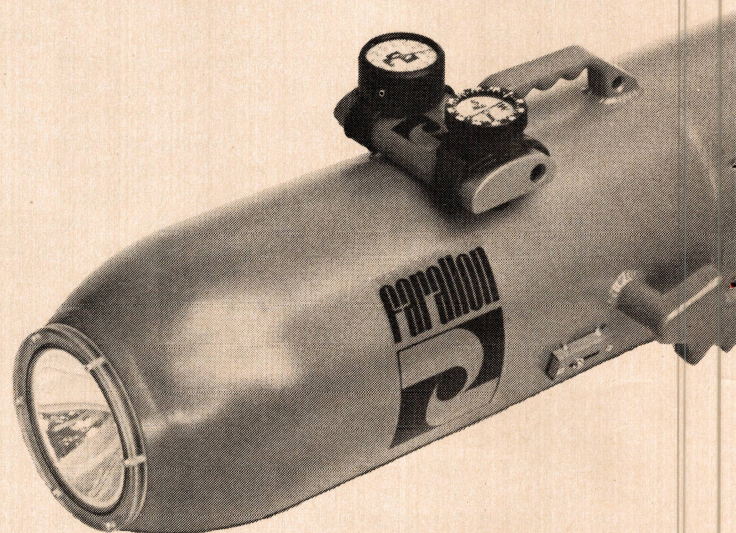
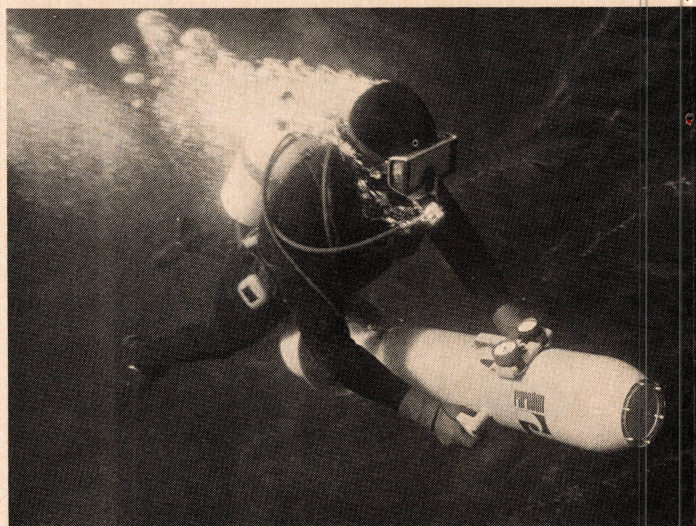
With the introduction of the Farallon DPVs almost three years ago, underwater diver transportation took on a new meaning. Of the dozen or so underwater scooters that have been introduced to the diving market over the past ten years, Farallon has designed, manufactured and marketed one of the most reliable machines currently being used. In 1971, there were some 600 units in the field. Amazingly, there are now nearly 5000 DPVs being used in many facets of diving; from inspecting oil well heads in the Gulf, to Sunday afternoon "DPVing" in the nearest midwestern quarry. Eleven different countries have bought Farallon DPVs for military applications. The difference between 600 machines three years ago and 5000 machines now is a growth rate of 800 percent. That's a sign of a pretty healthy product, especially when you consider these are a specialty item with a very poor track record prior to the arrival of the Farallon DPV on the scene. Not only are the machines extremely well made, but the company's warranty and repair policy are designed to keep customers enthused and happy with their products. Farallon will replace any unit within 90 days of purchase should it be defective in materials or workmanship. But it goes beyond that. Most of the Farallon employees are divers and take a personal interest in all of their products.

The Mark VI DPV is very easy to use. A flight instruction course isn't required to operate one. You just get on and go! However, there are two things you have to be very careful about. Of primary importance is the rate of ascent. Both the Mark V and VI are powerful machines and if you were to burst straight up to the surface you'd be exceeding the accepted 60 feet per minute ascent rate by a factor of five and a half to one. Naturally this could lead to serious complications due to sudden over-expansion of the lungs.

I found a good way of ascending is to turn down the power on the machine and ascend in a large sweeping circle up to the boat. While making a circular ascent I can keep an eye on my bubbles on the far radius of the circle to determine my ascent rate. Remember not to exceed your smallest bubbles. I also breathe out long steady exhalations and when I need more air I take in quick shallow gulps, which are enough to satisfy my oxygen requirements.

Rate of descent is important, too. It is best to descend in spurts, or again, on a long decline or circle, so that the ears can be properly equalized. The Mark V and VI can be operated with one hand, so the free hand can be used to block off the nostrils.

The second thing that you must be careful about is to tuck all loose straps and the underwater pressure gauge underneath the tank harness or weight belt, so that they don't dangle into the kort nozzle and get sucked into the propeller. That happened to me once. There was a terrible racket when the prop tried to chew up the gauge and spit it out the back end. I instantly let go of the handle switch and the only damage incurred was that the rubber covering on the gauge

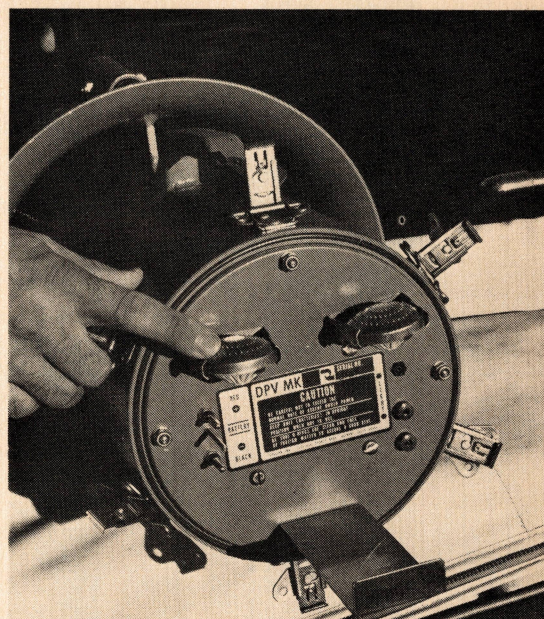
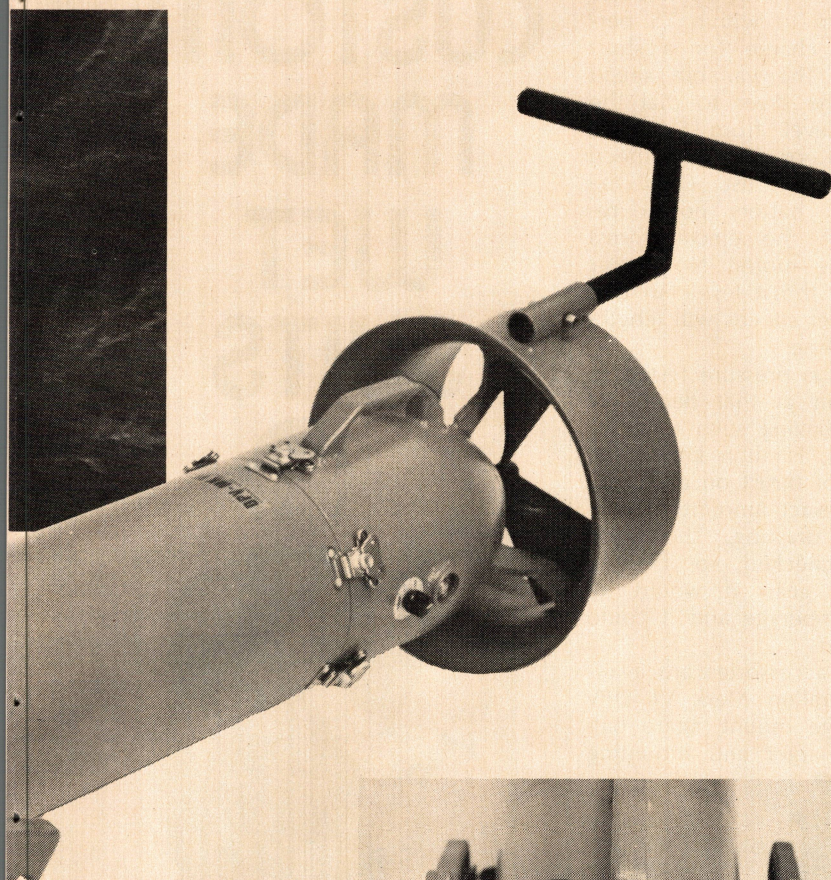


The power and speed of the Mark VI DPV is illustrated in above photo where diver's bubbles are trailing horizontally.

was cut in a few places. The propeller blades weren't damaged at all. Also, be careful about running it right through the kelp as the propeller suction will suck the strands into the kort nozzle tangling up the prop.

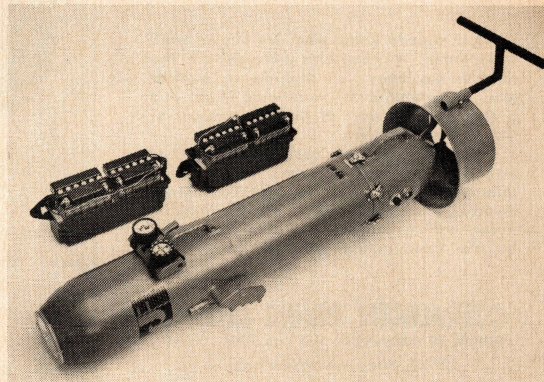
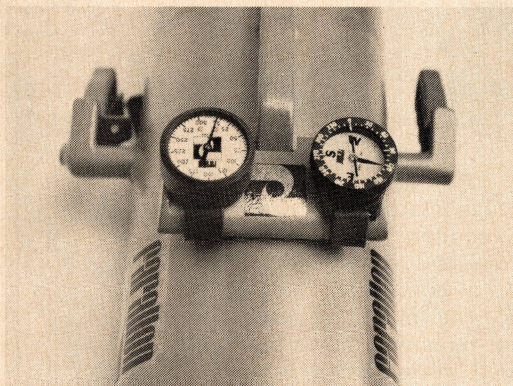
The prop is angled like an impeller in a pump jet so there is no chance of getting fingers caught in it from the back end. If you did stick your fingers or a snorkel in from the back, they would just be knocked back out. However, another cautionary note: the machine's speed can be adjusted while running just by moving your hand back along the side of the housing until it comes in contact with the speed control. Be careful that your hand doesn't slide back far enough that it might slip into the front of the kort nozzle. That could hurt.

Ralph and I returned from our 45 minute dive with 1100 psi of air left in our double tank blocks. And at one point we had touched down to 125 feet. I esti-



Four 12V batteries supply the power for the Mark VI DPV. In any enclosed battery system where hydrogen and oxygen gases are emitted it is important to have catalyzers (above) to convert these gases into nonexplosive water vapor.

photography by Author



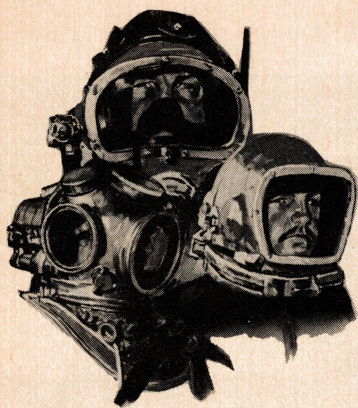
mated that a diver in a full wet suit, wearing a buoyancy compensator and swimming in the ocean at a depth of 20 feet, should cover about one half a mile before he runs out of air. That same diver, using a Mark VI DPV should be able to cover two miles before he runs out of air. That's an increased range factor of almost four to one. If the machine is run on full power the batteries will only last about 30 minutes, but the distance covered will still be 1.7 miles. If you want more distance and a longer battery time run the machine at a moderate speed.

Shamlan is constantly searching the field for new space age materials that he can incorporate into his revolutionary equipment designs and says, "... we are really in the Dark Ages when it comes to battery design. There shouldn't be any reason in the world

why we couldn't have an inexpensive, compact battery that would give ten times the life of present batteries." Silver-zinc batteries are available for the Farallon DPV; and will give an incredibly increased range over the lead acid batteries, but they are horrendously expensive. Farallon primarily supplies them with their DPVs to the military. Following is a chart describing the performance of the Mark VI DPV at various speed settings:

Speed Control Setting	Speed	CONTINUOUS OPERATION		RANGE	
		Lead-Acid Batteries	Silver-Zinc Batteries	Lead-Acid Batteries	Silver-Zinc Batteries
High Speed	3.7 mph	30 min.	2 hr./30 min.	1.7 miles	8.3 miles
Fast	3.4	33 min.	2 hr./45 min.	1.8	8.8
Medium	2.5	52 min.	4 hr./20 min.	1.9	9.5
120°	2.0	1 hr./15 min.	6 hr./15 min.	2.3	11.8
90°	1.5	2 hr.	10 hr.	2.7	13.5
Slow	1.0	4 hr.	20 hr.	3.8	16.5

(Continued on Next Page)



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SDM TESTS A DPV

(Continued from Preceding Page)

The 48 volt system can be run down to just about 25 percent of its charge, let rest for 15 to 20 minutes and it will return to within 75 percent of its full charge for a short period of time. The variable speed control allows the diver to dial the desired thrust level from 5 to 70 pounds of thrust, or on fixed speed — 90 pounds of thrust. Only the right amount of battery power required to generate the selected thrust is applied to the motor. No power is wasted at low thrust levels so that maintaining slower speeds will lengthen the running time.

Every machine is pressure tested to 300 feet and run at that depth for 15 minutes. By having such rigid inspection controls, Farallon knows the precise amount of thrust on each machine, and the exact amount of current that it is drawing. The noise output is also checked, so if there is a burr in a gear, it would be drawing more amperage and it could then be rectified.

A number of accessories are available for the Farallon Mark VI DPV including a gauge mount, spare batteries, battery charger and mounting



bands. The gauge mount is a handy accessory to monitor your direction and depth from and spare batteries will give you a constantly charged power source. The mounting bands can be used for mounting movie cameras and other instruments on for unusual filming effects or other various applications.

The Mark VI DPV retails for \$1295. The automatic battery charger is \$34.95. For brochures and additional price details see your favorite dive shop or write directly to Farallon Industries, 1333 Old County Road, Belmont, Ca. 94002. By using a DPV, not only will you considerably expand your range and time underwater, but you will have the added safety factor of conserving vital body heat and energy. Yes, the age of underwater flight is really here and it opens up underwater vistas that many sport divers have only dreamed about. Once you hitch a ride on a speedy Mark VI you'll feel like Superman, Captain Marvel and the Wright brothers all rolled into one! >

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CALIFORNIA UNDERWATER EXPO-MARCH 8



Top, left to right: Jean Michel Cousteau, Lee Tepley, Paul Tzimoulis, Al Giddings, Dr. Joe MacInnis. Bottom, left to right: Ernie Brooks II, Jack McKenney, Hannes Keller.

By
**Hillary
Hauser
Anderson**

Dynamite! Jean-Michel Cousteau, Dr. Joe MacInnis, Ernie Brooks II, Al Giddings, Jack McKenney, Lee Tepley, Paul Tzimoulis, and Hannes Keller; this is the line-up of outstanding personalities scheduled for the first California Underwater Exposition, to be held at the Anaheim Convention Center on March 8, 1974.

The evening program will take off at 8:30 p.m. with excitement and adventure the key themes. Jean-Michel Cousteau, president of Living Design Corporation and master marine architect who designed and built the Living Sea Museum aboard the *Queen Mary*, will highlight the show. He will appear in person to show the film *The Sunken Galleon*, which documents the *Calypso* crew's excavation of an ancient Greek amphora wreck in the Mediterranean which sank in 240 B.C.

Dr. Joe MacInnis, Undersea Research Ltd., Canada, will take the audience for a frigid dip beneath Arctic ice. His film documents his November-December, 1972, expedition to a point 125 miles from the North Pole, where his team of divers installed the spherical plexiglass underwater station *Sub-Igloo*. Working beneath the ice of Canada's Resolute Bay, 600 miles north of the Arctic Circle, MacInnis and his team braved sunless days and temperatures that averaged 45 degrees below zero. MacInnis' film will show what it's like underwater in the world's second largest deep-freeze, with cameras focusing on strange forms of submarine Arctic life.

Al Giddings (Sea Films, San Francisco) will warm us up a bit in his *Sea of Cortez*, a film which features mating octopuses and a hair-raising moment when an enraged sea lion charges at the camera. Award-winning cinematographer Lee Tepley will be there with his mind-boggling *Fire in the Sea*, a volcanic underwater documentation of molten lava flowing into the ocean off Hawaii, complete with sound effects. A psychedelic screen gem by California film producer Dave Adams entitled *Deep Blue World*, will offer viewers a kaleidoscopic underwater experience. From Europe will come the film *Undercurrents*, by Robert Lehman, which will

take the audience into huge schools of squid and battling crabs. Jack McKenney, editor of *SDM*, will plunge divers into the deep, eerie grave of the *Andrea Doria* and tell of the salvage attempt made on the luxury liner last summer. Ernie Brooks II (President, Brooks Institute, Santa Barbara) will present his dynamic multi-media screen odyssey against a pop musical 'background.

And, in a rare U.S. appearance, the legendary Hannes Keller will appear in person to present a short, classic film of his historic world record breaking 1000 foot dive, made off Catalina Island on December 2, 1962. It is significant that Keller's record, made over 10 years ago, has not been surpassed even today.

The fast-action, dynamic evening film show is only one part of the California Underwater Exposition. In the afternoon, the doors of the convention arena will open at 3 p.m. for a giant get-together. Diving equipment manufacturers will be exhibiting their latest lines, new photo equipment will be previewed, and other organizations working in and around the sea will be on hand to discuss their latest projects. It's a great chance to get to know other sea people, and to meet other divers.

The California Underwater Exposition Foundation will use all profits from the event to initiate, sponsor, promote and carry out plans and activities to further the preservation of marine life. One proposed project involves awarding cash grants to aspiring filmmakers.

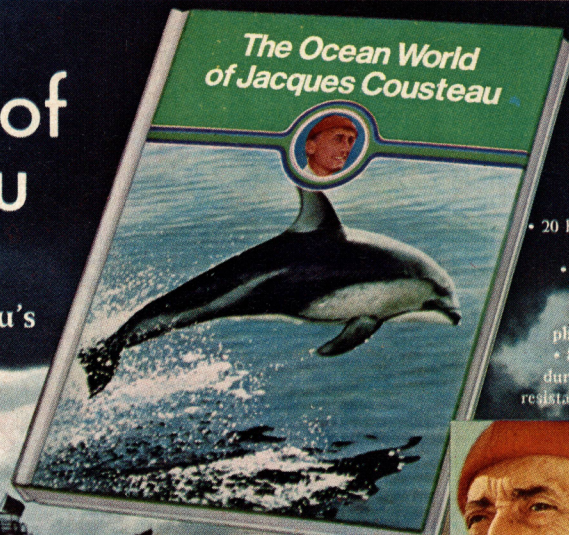
There are 10,000 seats in the huge auditorium at the Anaheim Convention Center (800 Katella Ave., Anaheim). Only 6000 of these will be sold so that everyone will have the best possible view of the exposition. Seating is reserved. Tickets are \$6 and \$4, which admits you to both the evening performance and afternoon exhibition/get-together. For advanced ticket sales or information, write: California U/W Expositions, Box 10931, Santa Ana, Calif. 92711, or phone (714) 675-4350. Tickets are also available at your local dive shops.

The first California Underwater Exposition will be a blockbuster sell-out. We'll see you there. 🐠

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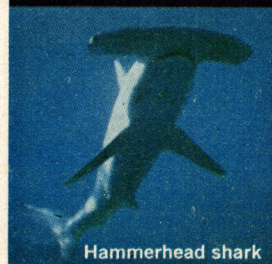


"Our children
need the
ocean to
survive"

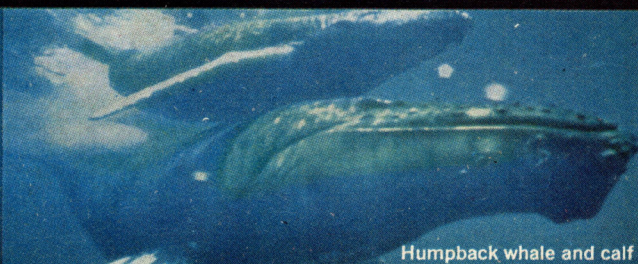
A message to you
from Jacques Cousteau...

If the Oceans of Earth should die—it would be the final catastrophe in the story of man and of all life on this planet... maybe fifty years later the last man on earth would take his own last breath. Why imagine such a nightmare about the subject I love most? Because the Ocean *can* die—and we must make sure that he doesn't. Man exists only because Earth is a "water planet"—liquid water being probably as rare in the universe as life, perhaps even synonymous with life. The Ocean *is* life. This is why we must change our attitude toward the Ocean. We must regard him as no longer a mystery, a menace, a dark and sinister abode of secrets and wonders. Instead we want to explore how he moves and breathes, how he experiences dramas and seasons, how he nourishes his hosts of living things, how he harmonizes the physical and biological rhythms of the whole earth, what hurts him and what feeds him—not least of all what are his stories.

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Hammerhead shark



Humpback whale and calf

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Explore the sea with Cousteau and discover...

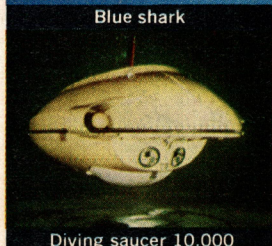
- That whales possess reduced bones of four limbs, hips and a neck—evidence of their likely beginnings as land mammals.
- That fish have a sixth sense that humans don't have—called "Lateral Line"—that allows them to sense pressure even from distant objects.
- That tiny neon gobys set up "cleaning stations" to remove parasites from other fish.
- That fish never stop growing—from the moment they're born until they die.



Bathyscaphe TRIESTE



Blue shark



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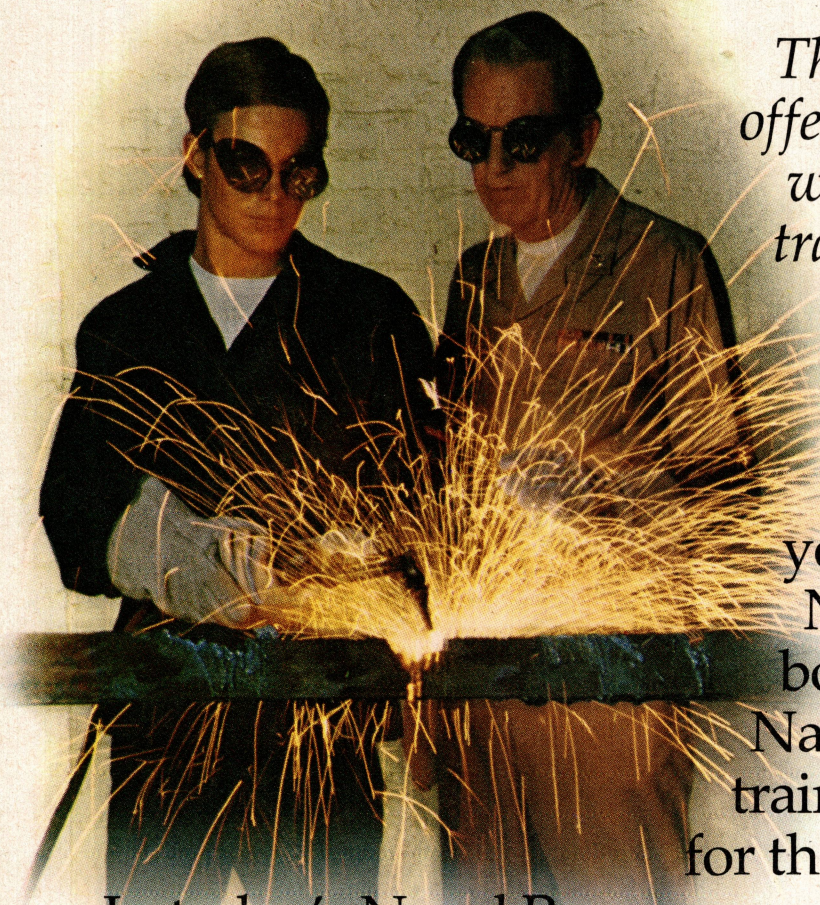
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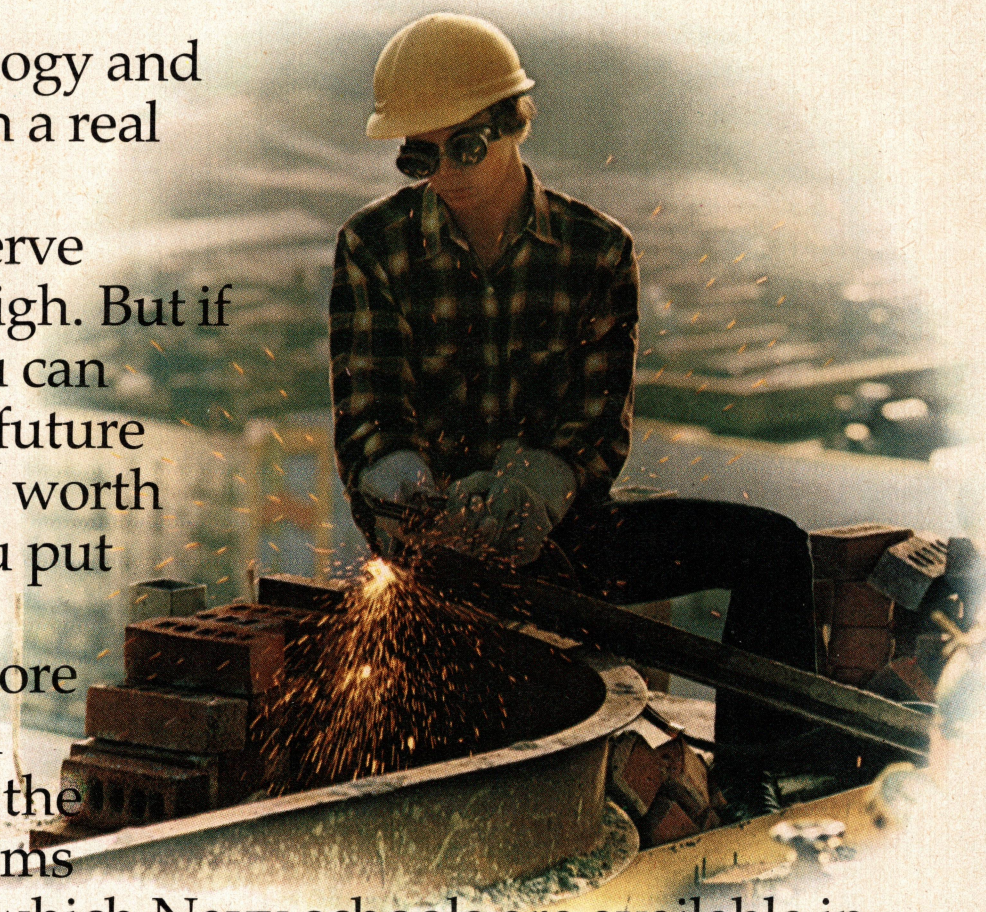
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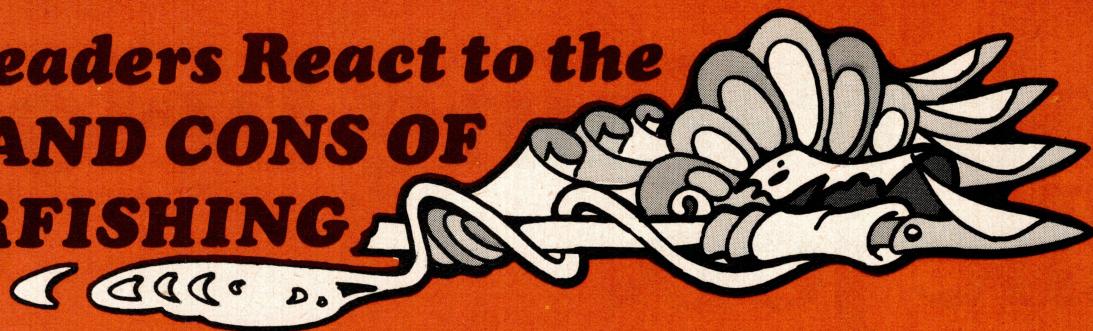
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SDM Readers React to the PROS AND CONS OF SPEARFISHING



... I have just finished reading Philippe Cousteau's article, "Reconsidering The Speargun." It is a powerful statement against the use of spearguns and the glamorization of the sport-hunter mentality. I highly applaud U.S. Divers' move to discontinue the manufacturing of all spearfishing equipment. I hope other companies will follow U.S. Divers' lead and also discontinue the manufacture and sale of this equipment.

When Philippe Cousteau states that a speargun is not essential for protection he is mirroring my beliefs 100%. As a photographer I spend a great deal of time underwater all over the world. I was attacked by a shark only once when a diving companion was spearfishing. I defended myself with my camera housing by shoving it at the shark, causing the animal to veer off.

While photographing, I have never carried a speargun or a shark billy, though in some dangerous areas I have had a companion carry a gun as a defensive prod. However, I dive alone most of the time with only my camera and the sea creatures for companions. My only defensive equipment is a pair of work gloves, long pants and a long sleeve shirt. I don't consider my camera a weapon. I use my own good sense, which is grounded in the belief of live and let live. If some day a shark eats me, I then will have paid back my debt to nature. After all, I have eaten enough other animals. In the meantime, I intend to continue recording the beauty of undersea creatures rather than indulge an outmoded instinct for self-preservation. A sound knowledge and understanding of the ocean and its inhabitants combined with a few simple precautions, is the best defense against dangers.

DOUG FAULKNER NEW JERSEY

... "Reconsidering The Speargun:" it was an excellent article and hope to see more like it. I have never liked hunting of any kind. It is my

personal opinion that hunting is a senseless sport. I will never understand the enjoyment some people get out of shooting animals that have no way of defending themselves against the high-powered guns that are used. I am glad to see that one company, U.S. Divers, is trying to put an end to the senseless killing of the many magnificent creatures of the sea.

JAMES MARCHESE BRONX, N.Y.

... Philippe Cousteau speaks one tongue, with which I heartily agree, but lives another, with which I disagree. Some of us are aware of the recent dynamiting by Calypso to get the big vessel in (to make diving a bit easier) British Honduras' Light-house Reef's Blue Hole.

His love of things big — the 50 year old groupers, sharks — makes me wonder if he really appreciates the beauty of the sea, which after all encompasses such a vast spectrum of marine life, most of which are small. Is it any less a sin to kill a lobster for Calypso's renowned dining table than it is to kill a grouper? But these, too, get on the bill of fare for Calypso divers. Perhaps they are exempt from the rules?

FRANK PARRISH WICHITA FALLS, TX.

... As a diver for the past four years, let me first say I sincerely enjoyed Captain Cousteau's T.V. specials and respect the views of both he and Philippe. I am employed as a conservation officer by the Kentucky Department of Fish & Wildlife and consider myself a conservationist, not a preservationist. The main difference is that the conservationist believes in man's use of natural resources when properly managed through strong programs controlled by biologists and enforced by laws; the preservationist believes everything should be left alone and nature allowed to control the total destiny of its species.

I am interested in underwater photography and never have used a

speargun. I realize the problem of controlling fish taken by speargun in international waters, but as for its control within territorial waters — good programs in law enforcement can help control rampant taking of any species.

The main point of disagreement I have with Phillippe is comparing hunting of wildlife to spearfishing. May I point out that almost all wildlife programs, and most money spent on them, are financed by the sale of hunting and fishing licenses and self-imposed taxes on guns and ammunition. The anti-gun and hunting groups talk loudly, but let's put the cards on the table: sportsmen pay the bills. For example, before 1930 no deer and almost no raccoon were in our state. The Kentucky Department of Fish & Wildlife financed a stocking program for these wild animals and today they are abundant throughout the entire state.

I do not have the experience of Philippe in fish study, but I cannot help but feel spearfishing results in less total destruction of fish populations than pollution from coastal cities, ships, rivers and other sources. As a conservation law enforcement officer and diver, I am interested in stopping any destruction or hunting of wildlife or fish — but only after proper biological programs have failed — not because of a simple case of "impulse."

LEWIS ELLIOTT

DEPT. OF FISH AND WILDLIFE
RESOURCES, FRANKFORT, KY.

... I applaud U.S. Divers' action and congratulate Philippe Cousteau on his concerned plea. Each one of us must heed to the call for survival. We must begin to confront divers we see carrying spears. Only by changing attitudes can we begin to solve the problem. We must make it socially unacceptable to kill.

Traditionally, diving has attracted a hardy, adventurous breed of man whose masculinity was proved by

strapping a tank of iron on his back and facing the "denizens of the deep." Now we see that there are no sea monsters and the most dangerous animal in the sea is man.

I only hope that we have a chance for survival as a species.

DANIEL J. GINGRAS

MANCHESTER, N.H.

. . . Congratulations and thanks to Philippe Cousteau and U.S. Divers Co. for their thoughts concerning the speargun, but mostly for placing the value of life in our oceans above financial gain. I hope others will follow their lead.

DR. EVAN CHANDLER

BRONXVILLE, N.Y.

. . . I really enjoyed the article Philippe Cousteau wrote about the speargun and how the sea is dying out. I know exactly how he feels when it comes to killing a living creature. When I killed my first living creature it was a little sparrow. My cousin Trey and I were hunting with BB guns that our grandmother had bought us. At first I thought it would be fun to kill a living creature but when I did shoot, I killed it with the first shot. I never felt so badly in my entire life. In fact, I broke my gun into a thousand pieces. From then on I made a vow not to kill anything unless it endangered my life, and even then it would be difficult to do something like that. To me, killing an animal, fish, or any other living thing would be like one person murdering another. I hope to get my PhD in ecology and a degree in marine biology so that I may someday help protect all life, both in the sea and on land.

JAMES BOLLING EAST POINT, GA.

. . . I applaud U.S. Divers' direct action to stop the manufacture and sale of spearguns and related equipment. I also appreciate Philippe Cousteau's sensitivity to the sea and his work to bring her life and mysteries closer to us. In regard to his article, "Reconsidering The Speargun," December 1973, however, I have a few comments.

My diving experience is limited to south Florida, particularly the Keys, so what I say is from my observations in that geographical area only. I have not yet seen the great decimation of the fish population Philippe speaks of on the French Riviera. Nor do I think spearfishermen will voluntarily give up their sport, for whatever reason they may give for hunting. Perhaps another alterna-

tive would be to control this hunting as much of land hunting is.

First, the weapons could be limited to hand spears and Hawaiian slings only, and used only if free diving. If a fish is too big or too deep for these limitations it should not be shot. Such a limitation of means to kill would hopefully reduce the amount of fish shot and killed. To further reduce the number of fish killed by spearfishing, competitive spearfishing could be banned. To protect the other undersea life, the species hunted could be limited to only recognized food fishes. There is no reason to shoot a fish too small to eat, or one either inedible or not known to be edible. If the situation seems serious enough, a bag limit, or size limit, could be set. As a last resort, certain areas might be set aside for spearfishing under restrictions listed above. A mariculture might be developed that could restock such an area.

All the above proposals, if voluntarily followed by all divers, might prevent an eventual decimation of the large food fishes, and protect the smaller fish now so often shot for "sport." As one who does follow these guidelines, the "sport" of spearfishing is even more difficult given the limited means of a sling or hand spear used while free diving. Unfortunately, though, if not all divers follow these proposals, the situation might become serious enough to enact such guide lines as laws. If even these guide lines can be proved inadequate, I will be the first to drop my sling into the Gulf Stream.

JAMES REED MIAMI, FL.

. . . Thank you for Philippe Cousteau's article "Reconsidering The Speargun." There is, indeed, something particularly tragic about the fact that divers — so attracted to the sea's beauties — have done so much to destroy them.

As we have despoiled so much of the land, we now invade the undersea with spears and collectors' bags, without regard for the life we prey upon. Those of us who have seen the result, who know what once was, testify against the slaughter.

The Cousteaus have spoken out eloquently against the rape of the seas; so have such others as Hans Hass, Jacques Piccard, Hannes Keller, Stan Waterman and SKIN DIVER. No diver of conscience can ignore their appeal.

Now, U.S. Divers Co. has sacrificed a \$250,000 annual market by

announcing that it will no longer produce or market spearguns or spears. We recommend that action, and hope the example will be followed by other suppliers of diving equipment, with the active support of certifying organizations and individual divers everywhere.

Our Association, with a growing enrollment in 32 countries, believes that divers have a responsibility to protect the underwater world they have helped to discover.

JAMES A. HORSTMAN

INTERNATIONAL DIVERS ASSOCIATION, CHICAGO, IL.

. . . I have been diving for 11 years and have never used a speargun. I have never seen any "sport" in fishing or hunting. I must admit that I never have condemned the "sport" only because I felt that those who participate in it and don't abuse it have the right to continue.

However, it is becoming increasingly apparent that there are those who do abuse the sport. It is surprising that sportsmen haven't learned the lesson taught us by the near extinction of the buffalo and the bald eagle. It baffles me why mankind, for the sake of its selfish pleasure, continues to upset the balance of nature. It seems to me that whatever beauty nature creates, man will eventually destroy.

I applaud U.S. Divers' decision to discontinue the manufacturing of spearguns, heads, etc. I ask that your magazine publicly support U.S. Divers' decision and urge other manufacturers to follow. I also ask that you urge the entire diving community to support U.S. Divers.

We are faced with a difficult situation. We should all recognize this problem and endeavor to reverse the senseless waste. The diving community has joined together to defeat legislation that called for licensing of divers and dive shops, in an effort to show our lawmakers that we are responsible people. We should again unite to show everyone that we are indeed responsible people and that we do share a genuine concern for our environment.

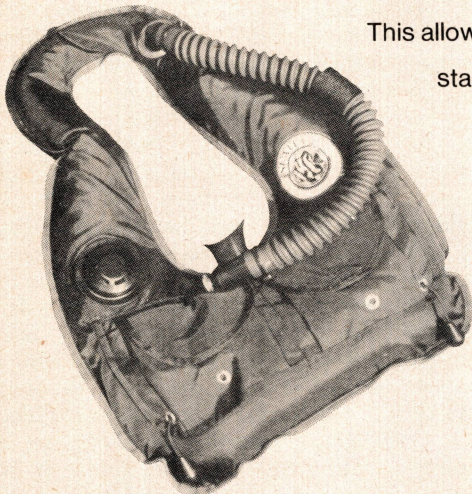
JAMES W. CLAIR BAYSIDE, N.Y.

. . . We support your decision to print Philippe Cousteau's stand on spearfishing. The damage done by our enthusiastic spearfishermen is becoming more and more apparent as sport diving becomes more popular. Articles like P. Cousteau's are needed to educate the diving public.

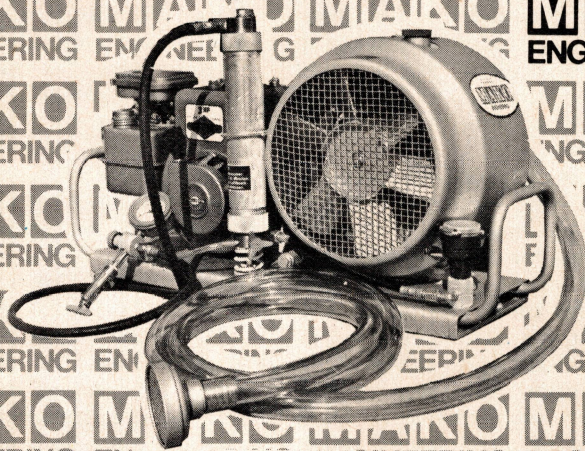
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NAUI Equipment Seminar, Los Angeles.
(Contact: NAUI Pacific Branch, 867
Basin St., San Pedro, Calif. 90732)

February

NAUI Ice Diving Seminar, Flint, Mich.
(Contact: NAUI Central Branch, Box
14156, Minneapolis, Minn. 55414)

February 4

Commercial Diving Class. (Contact: Divers Institute of Technology, Dept. S, Box 70312, Seattle, Wash. 98107)

February 5 & 19

Professional Regulator Repair Technician Course, Chicago. (Contact: Berry, 4889 S. Archer Ave., Chicago 60632)

February 5-March 12

Underwater Photo Course. (Contact: Skin Diving School of New York, 3470 Webster Ave., Bronx, N.Y.)

February 7 & 21

Underwater Photo Course, Chicago.
Contact: Berry, 4889 S. Archer Ave.,
Chicago, Ill. 60632)

February 9

NAUI Ice Diving Seminar, Nelson, N.H.
(Contact: NAUI North Atlantic Branch,
Box 291, Back Bay Annex, Boston,
Mass. 02117)

February 9, 16, 23

NAUI Advanced Physiology Seminar,
Houston, Texas. (Contact: NAUI South-
west Branch, 2120 Peckham St., Hous-
ton, Texas 77019)

February 14-17

NASDS Store Owners Only Clinic, Chicago. (Contact: NASDS Educational Division, 1214 Rosecrans, San Diego, Calif. 92106)

February 16-17

YMCA Instructor Institute, Odessa, Texas. (Contact: Frank Parrish, 1007 Ninth, Wichita Falls, Texas 76301)

February 16-17

YMCA Instructor Training Workshop III
& IV, Lansing, Mich. (Contact: Ronald
H. Smith, 33191 Kathryn, Garden City,
Mich. 48135)

February 16-17

YMCA, Scuba Instructor Institute.
Cleveland, Ohio. (Contact: Dr. John
Simpson, 33112 Lake Rd., Avon Lake,
Ohio 44012)

February 23-24

YMCA Advanced Divers Workshop, Jonesboro, Ark. (Contact: Glenn Galtere, Harrisburg Rd., Jonesboro, Ark. 72401)

February 23-24
YMCA, Scuba Instructor Institute.
Springfield, Ohio. (Contact: Fred D.
Crownier, 7959 Dixie Hwy. No. 3,
Florence, Kentucky 41042)

February 23-24
Midwest Ice Diving Course, Chicago.
(Contact: Berry, 4889 S. Archer Ave.,
Chicago, Ill. 60632)

February 23-March 2
Diving Medicine course (physicians
only), University of Hawaii School of
Medicine. (Contact: Richard H. Strauss,
M.D., Univ. of Hawaii School of Med-
icine, 1960 East West Rd., Honolulu,
Hawaii 96822)

March
YMCA Instructor Institute, Rochester,
N.Y./New England area. (Contact: Walt
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muda. (Contact: Skin Diving School of
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March 11
Commercial Diving Class. (Contact:
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Box 70312, Seattle, Wash. 98107)

March 15
NAUI Int'l Photo Competition, Seattle,
Wash. (Contact: NAUI North Pacific
Branch, 6531 N.E. 198th St., Seattle,
Wash. 98155)

March 15-17; March 29-30; April 19-20
NACD-PADI Cave Diving Course, Bran-
ford, Fla. (Contact: R. S. Dickens, 7212
Eudine Dr. N., Jacksonville, Fla. 32210)

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YMCA Instructor Institute, Odessa, Tex-
as. (Contact: Frank Parrish, 1007 Ninth,
Wichita Falls, Texas 76301)

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YMCA Pre-Institute Workshop, Houston,
Texas. (Contact: Jan McGinnis, 10010
Memorial #1413, Houston, Tex. 72024)

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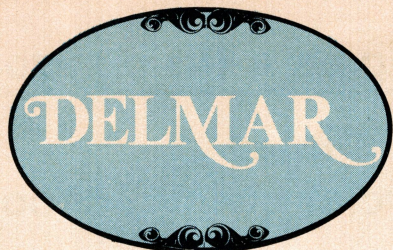
• Allows rapid fire
of camera — U/W
while using strobe or flash.

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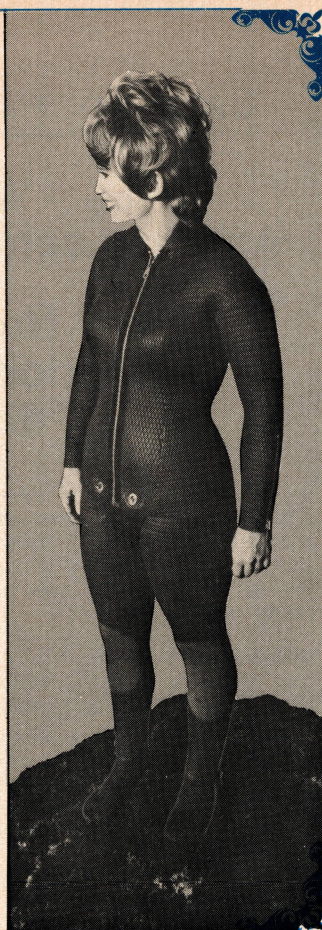
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March 23

NAUI Diver Rescue Workshop, Philadelphia, Pa. (Contact: NAUI Mid-Atlantic Branch, P.O. Drawer C, Deepwater, New Jersey 08023)

March 23

YMCA Pre-Institute Workshop, Dallas, Texas, & Lawton, Okla. (Contact: D. Pat Ryan, 4332 Northaven Rd., Dallas, Texas 75229 & Ray Anderson, 1724 Elm, Lawton, Okla. 73501)

March 23

(5 weekends, excluding Easter)
PADI Advanced Open Water Program. (Contact: Marty Bayerle, Brooklyn Divers, 2917 Ave. I, Brooklyn, N.Y. 11210)

March 23-30

Diving Medical Seminar, chaired by Dr. S. Harold Reuter, Anthony's Key Resort, Roatan Honduras. (Contact: Kathy Taylor, Island Reef Safaris, 34 Ground Pine Rd., Wilton, Conn. 06897)

March 23-24

YMCA, Scuba Instructor Institute, Youngstown, Ohio. (Contact: Dr. John H. Simpson, 33112 Lake Rd., Avon Lake, Ohio 44012)

March 23-24

NAUI Man's Extension Into The Sea, Seattle, Wash. (Contact: NAUI North Pacific Branch, 6531 N.E. 198th St., Seattle, Wash. 98155)

March 23-24

YMCA Instructor Certification Institute, Port Huron, Mich. (Contact: Ronald H. Smith, 33191 Kathryn, Garden City, Mich. 48135)

March 24-29

NASDS Clinic, Rhode Island. (Contact: NASDS Educational Division, 1214 Rosecrans, San Diego, Calif. 92106)

March 26

Underwater Photo Course. (Contact: Skin Diving School of New York, 3470 Webster Ave., Bronx, N.Y.)

March 30

NAUI U/W Symposium & Film Review, College Park, Md. (Contact: NAUI Mid-Atlantic Branch, P.O. Drawer C, Deepwater, N.J. 08023)

March 30

YMCA Instructor Institute, Albany, N.Y. area. (Contact: Walt Hornberger, 7161 Spire Falls Rd., Gansevoort, N.Y. 12831)

March 31

NAUI Underwater Photo Seminar, College Park, Md. (Contact: NAUI Mid-Atlantic Branch, P.O. Drawer C, Deepwater, N.J. 08023)

April 6

NAUI Underwater Symposium, Cambridge, Mass. (Contact: NAUI North Atlantic Branch, Box 291, Back Bay Annex, Boston, Mass. 02117)

April 6-7

YMCA Workshop, Houston, Texas. (Contact: Jan McGinnis, 10010 Memorial #1413, Houston, Texas 77024)

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April 6-14

NAUI Extended Bio-Marine Exploration Seminar, San Diego, Calif. (Contact: NAUI Pacific Branch, 867 Basin St., San Diego, Calif. 90732)

April 7

NAUI Underwater Photo Seminar, Boston, Mass. (Contact: NAUI North Atlantic Branch, Box 291, Back Bay Annex, Boston, Mass. 02117)

April 7-13

NAUI Instructor Certification Course, Portland, Maine. (Contact: NAUI North Atlantic Branch, Box 291, Back Bay Annex, Boston, Mass. 02117)

April 8, 15, 22, 29

Underwater Photo Course, Chicago. (Contact: Berry, 4989 S. Archer Ave., Chicago, Ill. 60632)

April 10, 17, 24

Professional Regulator Repair Technician Course, Chicago. (Contact: Berry, 4889 S. Archer Ave., Chicago 60632)

April 13-20

NAUI Instructor Certification Course, Portland, Maine. (Contact: NAUI North Atlantic Branch, Box 291, Back Bay Annex, Boston, Mass. 02117)

April 15

Commercial Diving Class. (Contact: Divers Institute of Technology, Dept. S, Box 70312, Seattle, Wash. 98107)

April 15

Professional Diving Instructor Course, Monterey, Calif. (Contact: Ed Brawley, 598 Foam St., Monterey, Calif. 93940)

April 15-19

NAUI Advanced Diving Course. Cay Sal Island. (Contact: LCDR B. J. McGee, USN, 4206 Plaza, Fairfax, Va. 22030)

April 18-June 7

NASDS College, San Diego. (Contact: NASDS Educational Division, 1214 Rosecrans, San Diego, Calif. 92106)

April 20

NAUI Underwater Film Review, New York. (Contact: NAUI North Atlantic Branch, Box 291, Back Bay Annex, Boston, Mass. 02117)

April 20

PADI Master Diver Course, Chicago. (Contact: Berry, 4889 S. Archer Ave., Chicago, Ill. 60632)

April 20-21

YMCA, Scuba Instructor Institute, Springfield, Ohio. (Contact: Fred D. Crowner, 7459 Dixie Hwy. No. 3, Florence, Kentucky 41042)

April 20-22

NAUI Instructor Qualification Program, Montreal, Que., Canada. (Contact: NAUI Canada, 10 Monet Ave., Etobicoke, Ont., Canada)

April 20-27

NASDS Advanced Diver Training, Bahamas. (Contact: Skin Diving School of New York, 3470 Webster Ave., Bronx, New York)

April 26-28/May 4-5 & 11-12

PADI Instructor Certification Institute, Chicago. (Contact: Ralph D. Erickson 23R, 6301 N. Sheridan Rd., Chicago, Illinois 60660)



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PADI Master Diver Course, Chicago.
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Chicago, Ill. 60632)

May 25-27

7th Annual Seminar on Cave Diving,
Jacksonville, Fla. (Contact: National
Association of Cave Diving, 2900 N.W.
29th Ave., Gainesville, Fla. 32601)

May 28

NAUI Advanced Diving Course. (7
weekends). Washington, D.C. area.
(Contact: LCDR B. J. McGee, USN,
4206 Plaza, Fairfax, Va. 22030)

June

NAUI Instructor Training Course, State
College, Pa. (Contact: NAUI Mid-At-
lantic Branch, P.O. Drawer C, Deep-
water, N.J. 08023)

June

NAUI Instructor Training Course, San
Diego, Calif. (Contact: NAUI Pacific
Branch, 867 Basin St., San Diego,
California 90732)

June

NAUI Instructor Training Course, Eur-
eka, Calif. (Contact: NAUI Pacific
Branch, 867 Basin St., San Pedro,
California 90732)

June

NAUI Divemaster Seminar, Victoria,
B.C., Canada. (Contact: NAUI Canada,
10 Monet Ave., Etobicoke, Ont., Can.)

June 1 (5 weekends)

PADI Advanced Open Water Program.
(Contact: Marty Bayerle, Brooklyn Div-
ers, 2917 Ave. I, Brooklyn, N.Y.)

June 2, 9, 16, 23, 30

Underwater Photo Course, Chicago.
(Contact: Berry, 4889 S. Archer Ave.,
Chicago, Ill. 60632)

June 5, 12, 19, 26

Professional Regulator Repair Tech-
nician Course, Chicago. (Contact:
Berry, 4889 S. Archer Ave., Chicago
Illinois 60632)

June 8-9

YMCA Instructor Institute, Houston, Tex-
as. (Contact: Jan McGinnis, 10010
Memorial #1413, Houston, Texas)

June 8, 22

PADI Master Dive Course, Chicago.
(Contact: Berry, 4889 S. Archer Ave.,
Chicago, Ill. 60632)

June 16-21

NASDS Clinic, Seattle, Wash. (Contact:
NASDS Educational Division, 1214 Rose-
crans, San Diego, Calif. 92106)

June 17

Commercial Diving Class. (Contact:
Divers Institute of Technology, Dept. S,
Box 70312, Seattle, Wash. 98107)

June 21-23

NAUI Divemaster Seminar, Tobermory,
Ont., Canada. (Contact: NAUI Canada,
10 Monet Ave., Etobicoke, Ont., Can.)

June 29-30

YMCA Instructor Institute, Jonesboro,
Ark. (Contact: Glenn Galtere, 2806 Har-
risburg Rd., Jonesboro, Ark. 72401)

SeaQuest

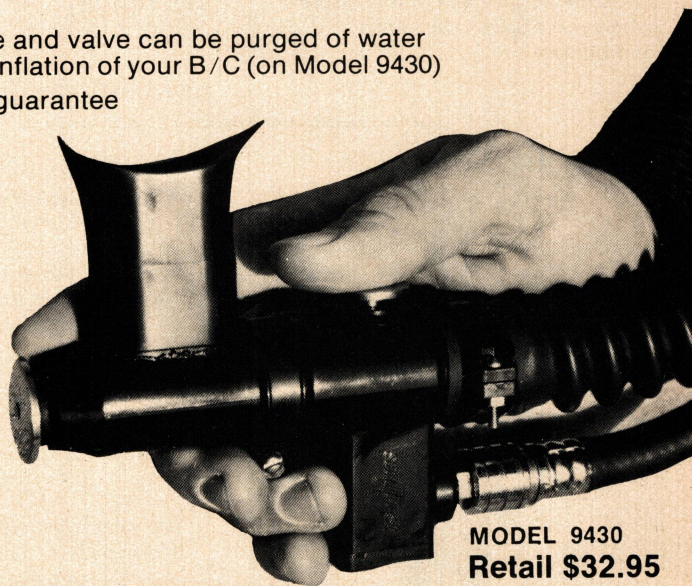
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In the Water ...

Duncan Dive's flexible weight belt ends clumsy annoying weights bothering you as you swim.

The flexible belt lets you achieve neutral buoyancy easily by filling it with lead shot (the exact amount depends on body weight). The belt automatically contours to fit comfortably.

Sometime you may need to get the lead out — fast. A quick release safety buckle lets you quickly remove the lead without removing the belt.

The Duncan Dive Belt puts pleasure where there used to be lumps and bumps.

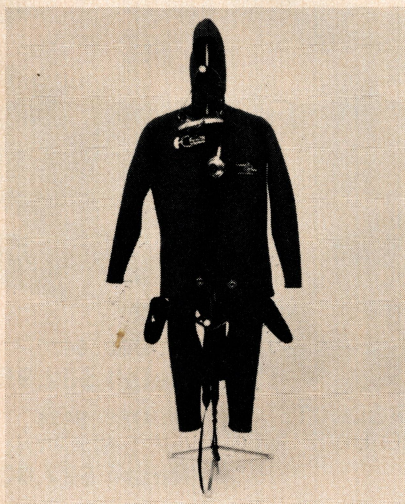


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June 30

Rick Frehsee Underwater Photo Course, Roatan, Honduras. (Contact: Kathy Taylor, Island Reef Safaris, 34 Ground Pine Rd., Wilton, Conn. 06897)

July

NAUI Industrial Orientation Course, San Diego, Calif. (Contact: NAUI Hqrs. 22809 Barton Rd., Colton, (Grand Terrace), Ca. 92324)

July 2-September 6

NASDS College, San Diego. (Contact: NASDS Educational Division, 1214 Rosecrans, San Diego, Calif. 92106)

July 6 (5 weekends)

PADI Advanced Open Water Program. (Contact: Marty Bayerle, Brooklyn Divers, 2917 Ave. I, Brooklyn, N.Y. 11210)

July 7 & 14

Rick Frehsee Underwater Photo Course, Roatan, Honduras. (Contact: Kathy Taylor, Island Reef Safaris, 34 Ground Pine Rd., Wilton, Conn. 06897)

July 8

Professional Diving Instructor Course, Monterey, Calif. (Contact: Ed Brawley, 598 Foam St., Monterey, Calif. 93940)

July 19-20

YMCA Instructor Institute, Jonesboro, Ark. (Contact: Glenn Galtere, 2806 Harrisburg Rd., Jonesboro, Ark. 72401)

July 22

Commercial Diving Class. (Contact: Divers Institute of Technology, Dept. S, Box 70312, Seattle, Wash. 98107)

July 25 (8 sessions)

NAUI Advanced Diver Course, 7 p.m. (Contact: Fred Calhoun, P.O. Box 291, Back Bay Annex, Boston, Mass. 02117)

July 27-August 3

NAUI Instructor Training Course, Peterborough, Ont., Canada. (Contact: NAUI Canada, 10 Monet Ave., Etobicoke, Ont., Canada)

August 3-10

NAUI Instructor Training Course, Houston, Texas. (Contact: NAUI Southwest Branch, 2120 Peckham St., Houston, Texas 77019)

August 5-13

NAUI Extended Bio-Marine Exploration Seminar, San Diego, Calif. (Contact: NAUI Pacific Branch, 867 Basin St., San Pedro, Calif. 90732)

August 10-11

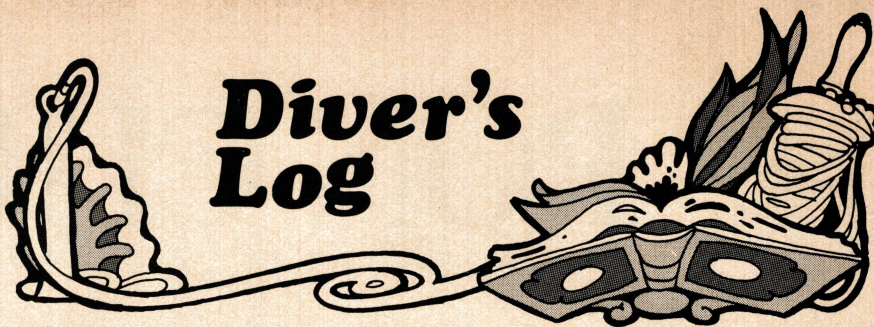
YMCA Instructor Institute, Jonesboro, Ark. (Contact: Glenn Galtere, 2806 Harrisburg Rd., Jonesboro, Ark. 72401)

August 10-18

NAUI Instructor Training Course, College Park, Md. (Contact: NAUI Mid-Atlantic Branch, P.O. Drawer C, Deepwater, N.J. 08023)

(Continued on Page 80)

Laurent Broussal was born and raised in San Francisco, California, where he began diving in the late 1930's when diving goggles made their first general appearance on the market in the United States. He took advantage of service in the Navy to participate in free diving from the warm, clear waters of the South Pacific island areas through the Philippines and north to the waters of Okinawa after the Second World War. Then he "became acquainted with UDT training at Coronado, California, an experience well worth the price of admission." During the early 1960's, Broussal spent a certain amount of time teaching diving through the YMCA, and has continued diving for fun and food to this day. Other of his favorite activities include hunting, fishing, camping and flying small planes. An educator by profession, he has had 20 years experience in regular, special and adult teaching and counseling and is currently working in adult education administration with the San Francisco Community College District.



THE INS AND OUTS OF SAFE DIVING

BY LAURENT R. BROUSSAL

During the years I have been associated with diving I have arrived at the conclusion that in most basic scuba classes water entries — front entries, back entries, roll-over entries, surf entries, etc. — are all thoroughly taught while exits are given relatively little attention. Why this particular instructional approach has prevailed is a mystery to me, since anyone entering the water must exit.

There are a number of reasons why exiting should receive at least as much classroom attention as entering. For one thing, conditions are apt to change

during the period a diver is in the water; quite likely for the worse. Also, fish, shells or other goodies may add to the diver's reasons for concern after a dive. Fatigue must be reckoned with following even a limited time in the water, as well as the natural letdown — and concomitant relaxation of caution — which often accompanies the end of a dive. Though not usually sufficient to cause problems, that letdown may be a contributing factor in a dangerous set of circumstances.

A dive which begins with an easy

entry, then, may end with an extremely difficult exit. Knowing this, you, the diver, should plan every dive to provide alternate exit spots in case of a change in the situation. Ideally, before you start diving, you should know the direction of prevailing wind and water conditions of the area, as well as in which direction changes are most likely to go, and select landing sites accordingly. Also, you should pay attention to changes in conditions while diving.

If, somehow, you find yourself

(Continued on Page 84)

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RON CHURCH

In Memorium



By Edward C. Cargile

A great loss to diving occurred on October 20, 1973, with the passing of Ron Church, who succumbed to a brain tumor. During his highly active and successful life, Ron contributed greatly to man's understanding of the sea and shared his vast knowledge in underwater photography with thousands of people.

Throughout his 23 years of diving, Ron documented sea life all around the world. His articles and photos appeared in most major periodicals, including *Life*, *Holiday*, *Scientific American*, *SKIN DIVER*, *International Wildlife*, *Oceans*, *National Geographic*, *Diving World*, and numerous other publications. Ron was also very accomplished as a cinematographer, filming for Westinghouse Electric Corporation, Eastman Kodak, Jacques Cousteau and Ivan Tors, plus producing several of his own underwater films. For three years Ron was the only American photographer on Cousteau's Calypso diving team. He shot a lot of footage for the TV series "The Undersea World of Jacques Cousteau."

Hundreds of Ron's photos were published in numerous books, including six he authored. Two of Ron's books are on U/W photography: *Beginner's Guide to Photography Underwater*, and *Underwater Photo Data Log Book*.

During his impressive career, Ron won many major underwater photography contests. He was honored in 1964 as the co-winner of the "Underwater Photographer of the Year" at the International Underwater Film Festival in Santa Monica, California. Ron was awarded the first Scott Carpenter Award, presented annually to "someone who has, through continued effort, contributed to the advancement of underwater technology, and has, through his own creativeness, advanced man's understanding of inner space." Ron founded the Underwater Photographers of America and the San Diego chapter of the Underwater Photographic Society.

Deep diving research submersibles offered Ron an opportunity to take his photographic abilities even deeper. He was pilot of Cousteau's undersea vehicles, *Diving*

Saucer and the one man mini-sub, the *Puce (Sea Flea)*. He was also chief pilot of the Westinghouse submersible *Deepstar 4000*.

To fill a need for advanced underwater photographic equipment in sport diving, Ron founded and was president of Seacor, Inc. The San Diego based company develops, manufactures and distributes underwater lenses, strobe arms, viewfinders, plus several other types of underwater photographic equipment.

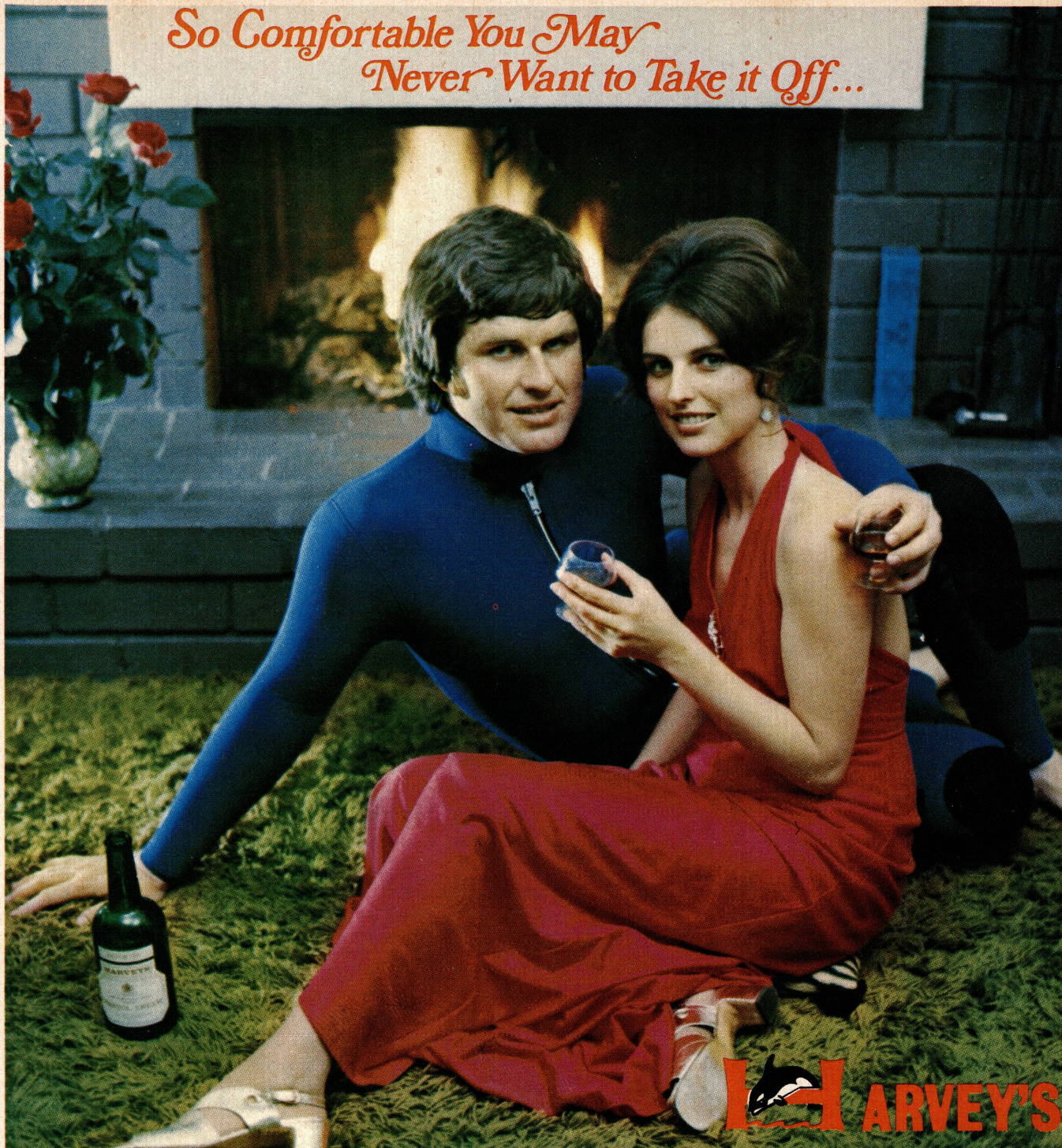
For several years Ron shared his knowledge of underwater photography through articles, books and lectures throughout the United States and Canada. He developed and founded the Ron Church School of Underwater Photography, which has trained instructors teaching his course across North America and several foreign countries. The courses are taught in dive stores, YMCAs, military installations and colleges in ever increasing numbers.

With his talented wife, Joyce, Ron ran a very successful photo agency, Photography Unlimited, which Joyce will continue to operate. With the dedicated interest of Joyce and several recognized leaders in underwater photography, engineering and management, Seacor and The Ron Church School of Underwater Photography will continue to grow and help divers record the beauty underwater.

Joyce Church has donated Ron's personal collection of color enlargements and artifacts for permanent display at Scripps Institution of Oceanography, University of California, San Diego. A memorial fund has been established to implement the exhibit at the Scripps Museum. Contributions can be sent to the Ron Church Memorial Fund, Scripps Museum, U.C.S.D., La Jolla, California. A public memorial service will be held in March to pay tribute to Ron's work.

Ron Church was a close personal friend to many, and helped many more advance in diving and underwater photography. Ron made a mark in diving history and will forever be with us through his books, articles, and most important, his beautiful underwater photos. ▀

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The purpose of this article is to help you eliminate one of the frustrations of U/W photography — the flash that fails to fire when the camera shutter is triggered. For tools and supplies, we use a jeweler's screwdriver with fine points, pipe cleaners, fine emery cloth, a pencil, WD40 silicone grease and rubbing alcohol.

Nikonos Camera — Unscrew the flash cord connector from the Nikonos casing and short the connector terminals with a screwdriver. If the flash fires when shorted, but didn't fire when connected to the camera, the problem is usually (1) bent or dirty terminals on the connector, (2) in the camera flash socket, or (3) inside the camera casing. Gently bend the center terminal (depending on design) of the connector outward and do the same with the center terminal in the camera socket. Use your finger tip to bend the three terminals



photograph by Jack McKenney

inside the camera casing outward. Gentleness is the key — these terminals can all be damaged.

If the terminals in the camera flash socket (two screw heads and a blade-like terminal in the center) are corroded, scrape them with a fine screwdriver point and then flood the socket with WD40. Let it soak for a few hours and wipe clean with a cloth. If necessary, use a fine point to remove dirt from the threads, but be careful not to remove metal. If the socket is dirty, but not corroded, scrape, flush with alcohol, blow dry.

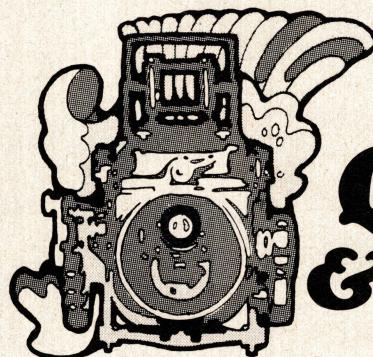
Tape a piece of emery cloth over a pencil eraser to clean the terminals inside the camera casing. Then use a pencil eraser, moistened with alcohol, to remove the residue of tiny particles from the emery cloth. The terminals of the cord connector can also be cleaned.

Some Nikonos-type connectors will not make contact

with terminals inside the socket when thick mounting bars are placed between the cord connector and the camera casing. This is because the threaded portion of the connector is not long enough to seat the connector terminals.

Housed Cameras — Begin with the PC cord that plugs into the camera. If the flash fires when this cord is shorted with a screwdriver, but didn't fire when connected to the camera, bend the center pin slightly off center. Plug the PC cord back into the camera and rotate it to loosen any dirt or oxide coating. A tiny drop of WD40 can be used to dissolve corrosion.

If the flash didn't fire when the PC cord was shorted, the problem is further down the line. Inspect the splices between the PC cord inside the housing (depending on design) and the camera/flash connector cord that penetrates the housing. They are often soldered,



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PART XXXVIII

By Jim and Cathy Church

FIGHTING FLASH FAILURES



taped connections that break loose.

Connector Cords — The problem may be a short inside the camera/flash connector cord (or PC cord if one is used inside a housing). This is usually the cause of those "occasional and unexplained" flash failures. The wires and/or insulation inside the cord will eventually break down at stress points — the ends where the cord is constantly bent or flexed. This can happen even if the outer rubber covering appears to be sound. If the flash occasionally fires by itself, without being triggered by the camera shutter, the cord is probably defective. If tested with an ohmmeter, flex the cord during the test — if the meter needle moves, the cord is defective. Sometimes the cord can be repaired by cutting the ends back past the broken wire and remounting the fittings.

Connector cords with cracked outer insulation, or with

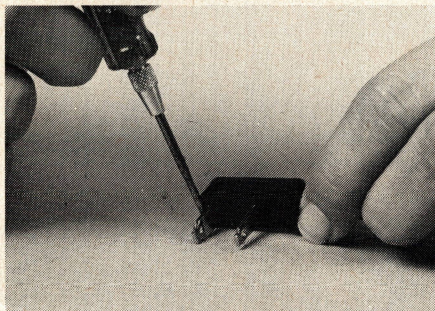
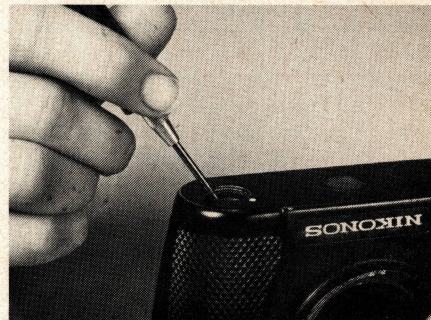
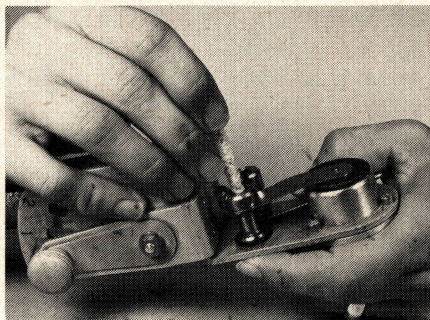
the insulation at the ends of the cord unsealed and exposed to seawater, can be ruined by internal corrosion. Seawater is forced between the wiring and insulation by sea pressure and remains there even if the cord is washed with fresh water after the dive.

Housed Strobes — Determine if the misfiring problem is with the strobe or the wiring system. Begin by firing the strobe with the PC cord you use for above water photography. If the strobe fires, the problems will be the same as for a housed camera. The center pin of a PC cord can be bent slightly off center to improve contact and check any splices in the wiring system. With the larger Honeywell Strobonars (models numbered 600 and higher) the cord plugging into the strobe has double prongs. If these prongs are made with a double thickness of metal, they can be spread apart with a

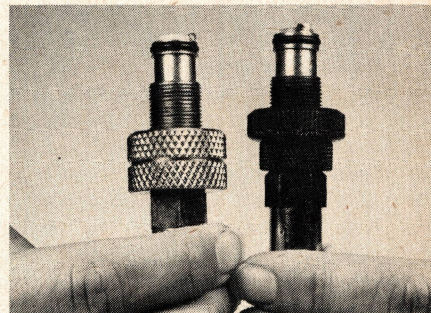
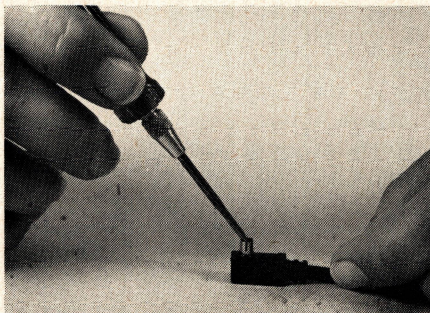
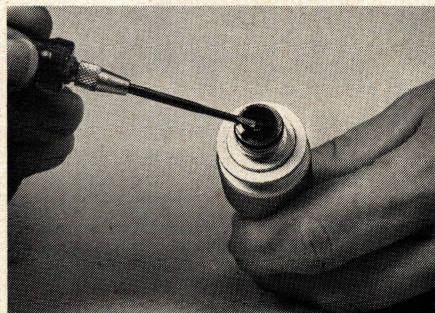
frequently with silicone spray, but use WD40 occasionally to dissolve corrosion. (5) Use an abrasive material to clean the bases of flashbulbs that have been exposed to seawater. Corrosion and oxide can build up quickly. (6) If the flash unit is several years old, the capacitor may need to be replaced.

EO Connectors — These connectors will give little trouble if they are kept lubricated with silicone grease or spray. They can be cleaned by spraying the connectors with WD40, plugging them together, and moving the male connector back and forth in a rotary direction. A stiff-bristled pipe cleaner and WD40 can be used to clean the female connector.

Preventative Maintenance — Read the manufacturer's instructions that come with each piece of equipment and follow these instructions to the letter. Always wash



A piece of fine emery cloth taped over a pencil eraser, or a pipe cleaner, can be used to clean some hard to reach flash parts. The center terminal in a Nikonos flash socket; the prongs on the PC cord used with some Honeywell Strobonars; the bendable terminal in the center of some Nikonos-type connectors; or the center pin of a PC cord can be scraped clean and bent slightly to insure better contact. The threaded portion of some Nikonos-type connectors is too short to properly seat the connector inside the Nikonos flash socket if thick, accessory mounting bars are placed between the connector and camera.



screwdriver so they will fit more firmly inside the strobe.

Flashbulb Systems — Flashbulb units will often fire when the camera and flash are above water, but fail when taken underwater. This is usually because of the increased electrical resistance caused by connections exposed to seawater — such as the bulb in the exposed socket. We recommend the following procedure: (1) Clean the battery terminals and contacts within the battery compartment. An invisible coating builds up which can impede the flow of electricity. This can be done with a rough cloth, with or without alcohol. (2) Check the batteries with a tester — they must be in peak condition. (3) Ikelite recommends removing the batteries when the unit isn't in use to prevent battery drain by the capacitor. The batteries can be stored in a refrigerator to prolong their life. (4) Spray the flashbulb socket

and disconnect cords and connectors at the end of each day's diving. We have seen several Nikonos flash sockets and cord connectors badly damaged because the photographers left them connected for several days after a dive. Be especially careful when screwing Nikonos-type connectors into a Nikonos flash socket. The metal of many connectors is much tougher than the metal of the camera casing. Thus, if the connector is cross-threaded and forced, it will be the camera casing that will be stripped of threads. The only solutions to the problem of stripped threads in a Nikonos camera casing are to (1) replace the casing — if you can find one — or (2) have a Sea Link connector system permanently installed on the camera casing. For more information about the Sea Link, write to: Sea Research and Development, P.O. Box 589, Bartow, Florida 33830. ➤

photographs by Authors

The Playful Porpoises

By Hillary Hauser Anderson

Hieros ichthys the Greeks called him — "the sacred fish." Ever since man first put out to sea he has respected, appreciated and loved the porpoise. In every ocean of the world, mariners throughout time have always enjoyed the company of these marvelous animals that speed across great distances for the sole purpose of playing. It's no wonder that the porpoise has come to be known as the sailor's best friend.

Porpoises are grouped with whales and dolphins under the scientific name Cetacea. Cetaceans are not fish, but warmblooded mammals that bear their young alive and nurse them after they are born. In fact, there's a beautifully close relationship between the mother and baby for as long as two years after the baby is born. It is suspected that the baby learns how to use his sonar from his mother, much like humans learn to read and write.

The amazing thing about these animals is that while they live completely independent of land, they need air to live! This is something when you realize that the porpoise feeds, sleeps, jumps and plays in the water all its life. Consider this: a porpoise will drown with only a tablespoon of water in its lungs, and needs to breathe on the average of every 30 seconds. (There have been some cases where a porpoise has held its breath for as long as six minutes, but this is unusual.) The blowhole is extremely sensitive to water and when a porpoise coughs it's because it is trying to clear water from its windpipe.

Porpoises are known to adjust extremely well in captivity, and it is never too long after capture that a porpoise is hard at play in whatever its new environment may be. There have been cases where porpoises, without any special training, have protected divers from sharks, the natural enemies of porpoise. Indeed, sharks do respect porpoises, which can knock them clear out of the water with ramming speed.

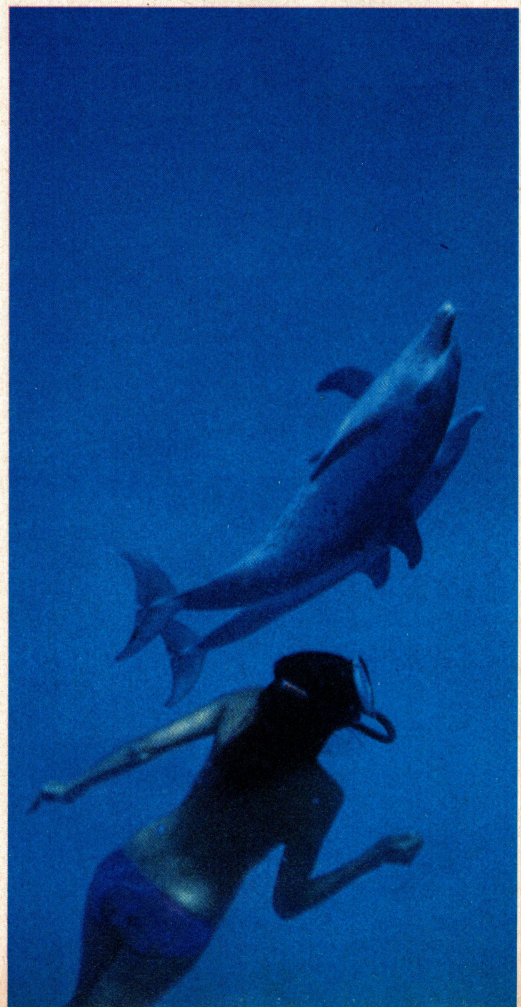
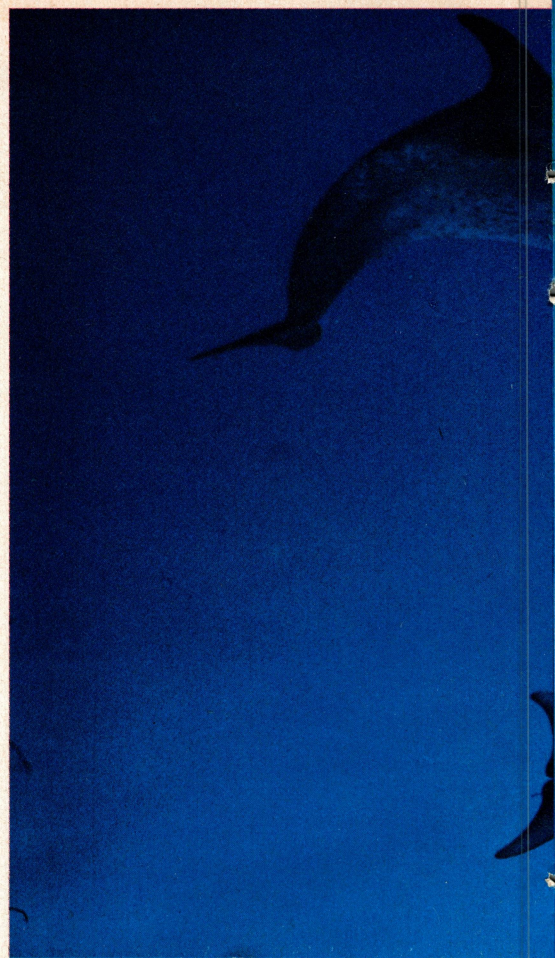
There is no known instance of a porpoise attacking a man, even when threatened. There is one case, recorded by Elgin Ciampi in his excellent book, *Those Other People, the Porpoises*, where a trainer set out to collect a mother and her baby for his porpoise

school. He first captured the baby, by hand. The mother swam around and around in circles, splashing, blowing and making a tremendous fuss. She followed the boat to shore, complaining all the way, and was happily joined with her youngster in their new home. The interesting thing here is that if a shark had threatened that same baby, it would have been instantly pummeled by the mother.

It is hard to describe the thrill of swimming in the wild with these graceful, loving, playful animals. In the summer of '72 I was part of a treasure expedition to the Bahamas. Wherever we went on the Little Bahama Bank, huge families of our friends came with us, leading the way as they played in front of our bow. When we stopped our boat they would circle a bit to see what might happen next, and then would soon swim away. We found that we could keep them around if we quickly jumped into the water with masks, fins and snorkels the minute the boat stopped, making noises in an attempt to imitate them. We found that if we dived to the bottom, 25 to 30 feet, they would follow us down, swimming in spiraling circles around us. They would stay around as long as we wanted to play, diving to the bottom and surfacing with us every time.

The classic and familiar symbol "Boy on a Dolphin," passed on to us from ancient Greece, has signified the close relationship of man to the porpoise. Present day scientists are beginning to find out just how important that relationship is. The time may soon come when porpoises will be used to patrol beaches and protect swimmers, to aid in search rescue and recovery operations, to lead fishermen to schools of fish and even herd them in. Already, porpoises have been trained to locate lost objects in the sea, and have served as messengers to aquanauts living in undersea habitats. As man continues his exploration of the sea frontier, he is finding that this marvelous sacred fish, the porpoise, can tell him much about living in the deep, and it could very well be that the playful porpoise is the best friend of not only the sailor but of all mankind. >

Photography by Dick Anderson







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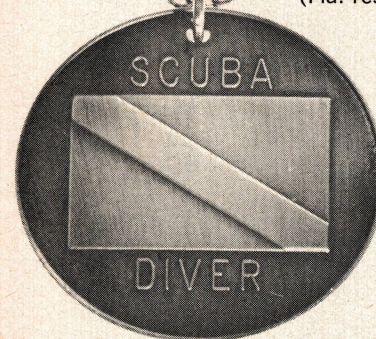
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all presented by outstanding person-
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Ben Cropp, Doug Faulkner, Dr. Hank
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JRE '74

Coles Phinizy, Dr. David Owen, Roger Payne, Al Ristori, Dr. Renate True, Dr. Wheeler North and Bob Wicklund.

The evening program consists of top speakers in the general interest category. Past featured speakers have been Philippe Cousteau, Ben Cropp, Scott Carpenter, Dick Anderson, Dr. Joseph MacInnis, Stan Waterman, Al Giddings, Dr. Perry Gilbert, Dr. Ken Read, and Paul Tzimoulis.

A highlight of the evening program is the presentation of the James Dugan Memorial Award for outstanding service in the aquatic sciences. Recipients to date have been: 1968 Dr. Lionel Walford; 1969 Dr. Eugenie Clark; 1970 Philippe Cousteau; 1971 Dr. Wheeler North; 1972 John Hughes.

If you are impressed with names,



one would assume that by this point you would be thoroughly impressed. But if you are more impressed with performance, with learning about programs in marine research, about the advances being made, about the problems and pleasures confronting all of us invaders of the littoral zone, about new discoveries with seeing films and slides on the work and experiences of these fascinating people, with the opportunity to talk with them in person — then the March 2 symposium at Hunter College in New York City has something for you.

Tickets are \$3 for the daytime program, \$4 for the evening, or \$6 combined. Contact: American Littoral Society Symposium, 33-38 164th St., Flushing, New York 11358.

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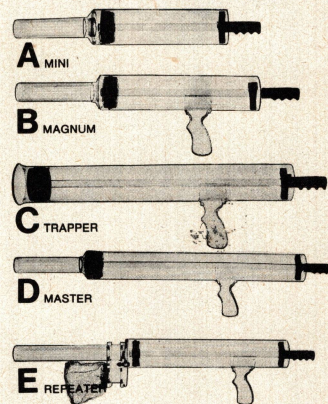
... Others stopped just recently and explained their action by blaming the spear fishermen for the drastic loss of sea life in our coastal waters.

That's not the reason we stopped advertising. We stopped because our company became more active in other fields. We certainly don't blame the spear fishermen for the fish depletion in our coastal waters...not when we see a thousand rod and reel men for every poor guy with a spear gun...not when we see commercial fishermen, purse seiners and long liners sweeping up and down our coast taking everything that comes within their grasp.

If legislation is needed to protect certain species, let's have it. If we need underwater parks or game preserves, let's create them. Let's use the traditional means for regulating sporting activities. Let's not lump the spear gun in with the Alaska Pipe Line, atomic power plants, off shore oil exploration and various and sundry other things that some people suddenly decide we don't need.

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ANDREA DORIA CAPER

Treasure Doors Opened

By Jack McKenney

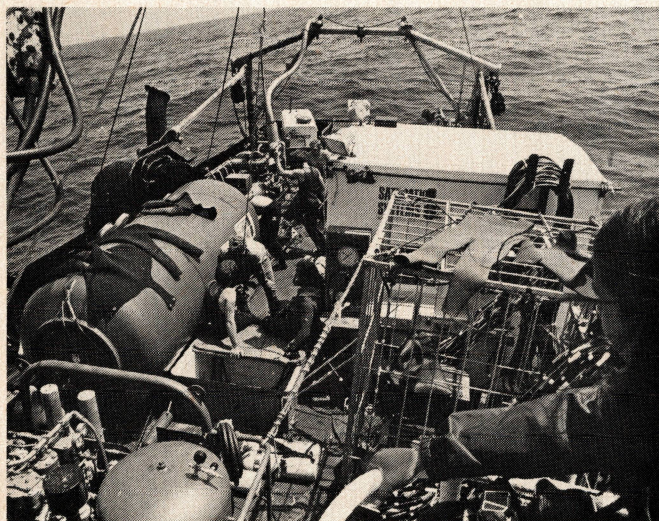
Don Rodocker and Chris DeLucchi are two young men from San Diego, California, who founded Saturation Systems Inc., in December, 1972. As their first project, they transported their dive system across the country on a flat bed truck, put out to sea from Fairhaven, Massachusetts, and saturated on the Andrea Doria. Their purpose was to cut through the ship's hull and salvage some of her valuables. The second part of our story begins with the author decompressing in a chamber on board the mother ship Narragansett reflecting on what had taken place during the first two weeks of the expedition.



It took us until Friday, July 27, to secure the habitat, which we had nicknamed *Mother*, to the side of the *Doria*. When we finally did get her down and Chris and Don saturated, an electrical cable parted so we had to bring her up to the surface, tow her back to Fairhaven, regroup, and start all over again. It took 28 hours to reach the port where a throng of curious onlookers and reporters were gathered on the dock. At about 4:30 p.m. *Mother* was swung around to the side of the dock, a heavy lifting cable attached and the slack taken up.

Don Gay gave the crane operator the signal to begin lifting her out of the water. Slowly her heavy bulk was swung up and over the edge of the dock where she was held about three feet in the air. Dave LeJune and Don Gay went over and knelt under her to close a loose hatch, which took them about 30 seconds. I had a funny feeling in the pit of my stomach while Dave and Don were crawling under there. They stepped back. One minute later the brake on the crane slipped and *Mother* slammed to the dock, smashing in her undercarriage. We couldn't believe it.

Fortunately, the crane operator quickly gained control of the situation and held onto the habitat, preventing it from toppling over into the water. Even so, there were 20 people on that dock who had to fight the urge to climb into the control cab and do in one crane operator. Chris and Don were still under pressure inside the habitat. If the seal on *Mother* had been damaged when she dropped, there would have been a resulting loss of gas pressure and our friends would have been wiped out right then and there due to the explosive expansion of



photographs by Bernie Campoli

Life aboard the *Narragansett*, an adapted fishing trawler.

gas in their saturated tissues. But the seal didn't break and the habitat was held there for another four hours, until 8:00 p.m., when Don and Chris stepped out to be greeted by their wives and *Narragansett's* crew.

During that week in port, John Clark and I flew back to California to take care of business and wait until the crew was over the site again before rejoining them. The following weekend, we flew back to the East Coast and caught a lobster boat out to the *Narragansett*. We arrived about 2:00 a.m. to a welcoming committee of four sleepy-eyed crew members. They were pretty happy to see us.

The *Doria* was formidable diving. It's deep — all of our working dives were between 160 to 200 feet, and in some cases dives were made to 230 feet. Currents made it treacherous and visibility was usually limited to

25 feet — although we did have some dives where visibility was upward of 50 feet. Everyone was dog tired from hauling cables, umbilical lines, and working 12 and 15 hour shifts. Numerous times everyone was brusquely awakened at 1:00 or 2:00 in the morning during a tide change to prevent the umbilical line to *Mother* from tangling up in the anchor line. More hauling, pulling, and lifting. To compound that kind of work with one or two deep working dives a day left everyone literally exhausted, so they were glad to have two more divers back to offer some relief.

The *Andrea Doria* lies in a shipping lane in the North Atlantic and it was always a worry that in dense fog there may be another collision, with the *Narragansett* ending up on the bottom beside the *Doria*. Just before John and I rejoined the group, that almost happened.

It was midday and the previous couple of days had been spent in securing two sets of buoys to the wreck — one set marking the stern and the other amidships at the doors. The *Narragansett* was a couple of hundred yards off from the buoys picking up *Mother* which had been anchored out of the way. A few of the divers were in the wheelhouse when they noticed a movement on the radar which indicated that a ship was bearing down on the site. A few moments later, they could actually see it. It looked as though it was about a 700 foot long containerized cargo carrier.

The carrier got closer and didn't swerve off course one inch. It was headed straight for the buoys. A shaken group of people watched as the cargo carrier tore right through the spot where the buoys had just been established, sinking a set of them.

We were constantly besieged by reporters calling over the marine telephone or coming out on boats requesting permission to come aboard for a story. We never let anyone on board because of the tremendous work load — we just didn't have the time. But one night, while I slept, the first mate broke the moor, revved up the mains and ran off the site. He said a boat had approached with the intent of boarding the *Narragansett*. Captain Jacobson woke up, but by that time the smaller boat was nowhere to be seen, so he returned the *Narragansett* to its moor.

At dawn the same boat, under the guise of being a different craft, approached and "demanded" permission to come aboard. They said they were reporters from the New York Times. Bernie Campoli and George Powell decided to run over to talk to them and it just so happened that George was in the pants part of his wet suit at the time. An article later appeared in the Saturday, July 28 Times: "George Powell is the 34 year old Navy master diver who is supervising the topside operation. Brawny and tattooed, he was smoking an enormous cigar and had knives strapped all over his wet suit." (Author's note: George smokes normal size cigars, has one tattoo and had one diver's knife strapped on his thigh.)

During the week back in port, Bernie, who was suffering from the flu, had to bow out from the rest of the trip so we were short one photo diver. Bob Coffey, a diving instructor and sport diver from Fairhaven, joined us and proved to be a capable and excellent man in the water. It was a good thing too, because just about every dive the photo team made was a working dive because of the lack of topside support that could be given to more than one team of divers in the water at a time. We'd take cameras down whenever possible, complete our task, and then do some filming.

Most of our photographic efforts took place around the habitat, down along the promenade deck, around the bow,

and down near the smokestack. Our movie cameras consisted of two 16mm Arriflex S cameras converted to 400 foot co-axial loads, and a 16mm Beaulieu also converted to a 400 foot load. All three of these cameras were housed in compact well designed housings built by Clark and Hollis, who own Oceanic Products. Most of our lighting was accomplished with Farallon ML350 movie lamps. For stills, I used a Nikonos, with a corrected 21mm Seacor lens, and a Mark 150 Subsea Strobe.

The photo team had two sets of equipment to use for diving. Initially, we were going to lower a shark cage to the wreck with two photo divers and a tender in it. Dressed in Unisuits, we were to have a come-home (piggy-back) bottle on our backs filled with heliox, plus a small bottle filled with compressed air for the Unisuits. (Manufactured by Poseidon Systems, Unisuits are made of neoprene rubber, but are water and air tight. Underwear is worn with them and air is introduced from the breathing system into them to offset squeezing water pressure.) We had U.S. Divers full face masks set up with Helephones for communications, and were to be supplied with a mixture of 68 percent helium and 32 percent oxygen from the support ship via umbilical cords. This would have given us up to an hour of bottom time to a depth of 170 feet on the wreck. If we had wanted to go deeper we would have had to use a gas mix with a lower partial pressure of oxygen.

Due to the time factor we were never able to utilize this system, so we dived from the surface using air. Beside the time problem, however, mixed gas proved to be so cold that we preferred to dive on air. True, we were clear headed with mix, but we were able to perform better, even when slightly narcosis, because the heat transfer property of helium is about six times greater than nitrogen. Hollis and I made a late dive, using mix, wearing wet suits, and were so cold we could hardly operate cameras.

The Unisuits were very warm underwater, but if we had to wait around on deck suited up, we would almost die of heat prostration in the hot sun. Some days the temperature soared to 80°. On many dives, then, I wore a quarter inch Farmer John Turtleskin wet suit with an additional eighth inch vest underneath, which was adequate in the 43° water.

We were constantly aware of blue sharks sunning themselves on the surface and a number of times, while we were working or decompressing underwater, they'd swim in to within five or six feet of us. One time I looked back over my shoulder when I got a tingling sensation at the back of my neck and not more than three feet away a seven foot blue was making a turn. And once, while Tim Kelly and John Clark were in the water photographing *Mother* at about the 30 foot level, a big blue came in and started to harass them. John was using a camera with a large dome port on it. Apparently the blue was attracted to it because the shark came in and mouthed the camera while it was in John's hands.

Shortly after that, Timmy literally had to kick one of the sharks off when it made an advance. Another time, while a diver was working on the surface around *Mother* and Tim and Dave LeJune were supporting the diver from the dory, a big blue came in. Tim dropped his hand in the water to see if the shark would come after it. The shark lunged and Tim nailed it with a Farallon shark dart. The shark writhed about on the surface, disappeared for about five minutes, then reappeared with its stomach blown out of its mouth.

One of the most difficult and frightening things about diving on the *Doria* is the currents that suddenly come

up, especially during a tidal change. We tried to time our dives as closely as possible to hit slack tide but it didn't always work out that way. On one excursion down into the promenade deck there was only a hint of a current flowing south over the ship. We dropped down through the opening into one of the cross passageways and spent about five minutes shooting pictures. When it was time to surface, we popped our heads up out of the promenade area. Just then, the rope that we had secured loosely to the hull appeared to be picked up off the deck by an invisible hand and swept right past us. Tim, Bob Coffey, and I were first up the anchor line and John, who was below us, said later that we were flowing straight out horizontally like flags in a gale as we pulled ourselves up to our decompression stop.

Part of the *Doria* is in surprisingly good condition with little growth on it. The hull, which is bare to the current, is very clean and in some places near the smokestack the teak deck is as smooth as if the ship had only been down a month instead of 17 years. However, when Bob, John, Tim, and I made an excursion to the bow to film the name one day, we dropped into the sundeck, an area protected from the swift currents, and found large colonies of bright sea anemones. The distance from the name back to our ascent line was over 300 feet and on that dive a brisk current sprang up as we started to swim back. Lugging heavy cameras and lights, it was an exhausted four divers that fought back to the ascent line.



Divers Albin, Trujillo, Weaver and Powell assisting Mother.

It was on Tuesday, August 7, that we were finally able to get *Mother* moored to the *Doria* once again. Don Rodocker and Gary Gayda rode *Mother* down to the wreck, and Hollis and I accompanied them with movie cameras to film the descent. The moment we left the surface, Bob raced to the hull and stationed himself there to film the event. I stayed with the habitat, holding a movie light on Don and Gary, who were working the ballast system and hand brake.

A strong current was running and unbeknownst to us *Mother* was being swept away from the planned landing spot by about 20 feet. The habitat continued to descend steadily, however, and Bob continued grinding away with the camera. Water visibility on that dive was good — about 40 to 50 feet. Through his viewfinder, Bob watched the habitat getting closer. It came level to him — then it disappeared! He looked around his camera and saw *Mother* sinking over the edge of the hull into the sundeck area.

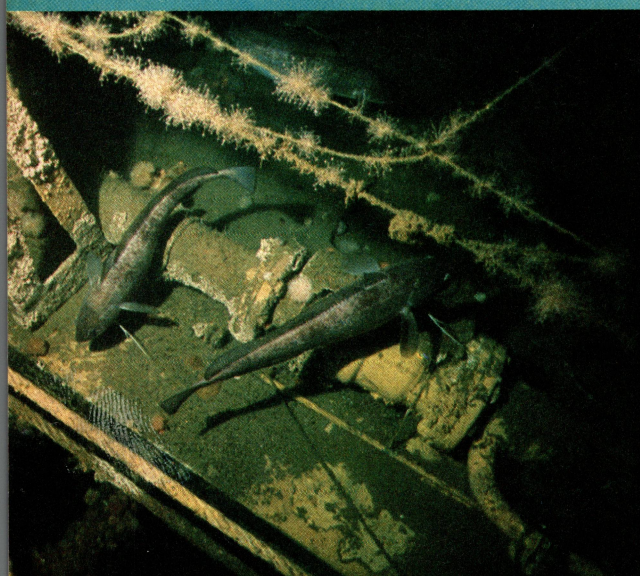
At about 180 feet, *Mother* came to rest, held there by the cable that was running parallel with, and then down over, the hull and deck. The habitat only had an inside

ANDREA DORIA

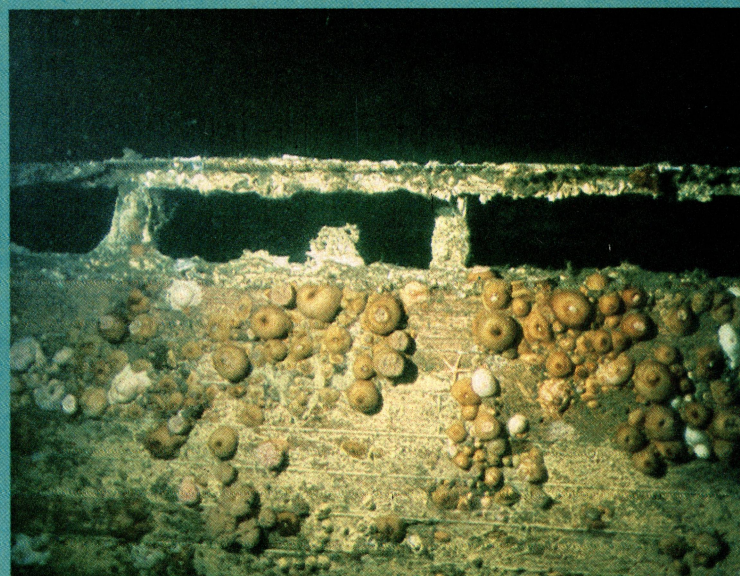
Sue DeLucchi displays all of the items that were actually retrieved from the Doria. Bob Hollis tried to add to the collection a sink that he wrested from one of the rooms inside the wreck, but it was lost on surface.



photographs by Author



Large, long barbeled hake abound on the wreck.



Some of the Doria's teak decking is still in very good condition.

pressure of about 175 feet. If she had sunk much past that depth, the hatch could have popped open and everything inside would have gotten wet. She would have continued to get heavier the deeper she went until she might have crashed to the bottom. Needless to say, trying to retrieve a 10 ton habitat 12½ feet long by 8 feet wide from surrounding debris would have been pretty difficult.

Gary and Don scurried frantically around her filling buoyancy tanks. She rose up and then played Yo-Yo over the edge of the *Doria* three times before the 1000 pound clump, two feet beneath her, settled on the hull. By this time, however, we were critically low on air so we brought *Mother* up to 70 feet and suspended her there on the cable. Chris, Tony Eidson, and Dave LeJune then made a dive to her and discovered that one of the purge regulators had malfunctioned. After repairs, it took a couple of more dives the following day to moor her securely. Finally, on Wednesday, August 8, Chris and Don saturated into their new home.

Shortly after Don and Chris saturated, Bob took me aside and said, "You know this sounds crazy, but I think the entire bridge has disappeared. I've been up over the bridge wing three times now and on this last dive, descended straight down into what should have been the wheelhouse, but I couldn't find it." From where the habitat was located on the wreck, we could look up and see the bridge wing, or Captain's walk as it's known, and we had just naturally assumed that the wheelhouse was attached to it. As a matter of fact, it was to be one of the target areas. We wanted to get the ship's wheel and charts, or log books that might be buried in the silt or put away in drawers.

The wheelhouse was there in 1967 when the Italians, led by Bruno Vailati, filmed the wreck, and although I didn't personally get into the wheelhouse the following year on the Krasberg expedition, I believe it was still there at that time. Our first suspicion was that someone had dynamited it off, but what may have happened is that the strong currents constantly tearing at it, with 17 years of corrosion, weakened it to the point where it was swept away from the ship. I did notice on a couple of dives down around the smokestack that some of the metal plates were badly buckled with many of them missing.

It had taken 26 days since the departing from San Francisco to get to the point where Rodocker and DeLucchi were ready to begin cutting operations to open the *Doria's* hull and get at the piggy banks. And now here I was with Hollis stuck in the chamber after making a fantastic night dive to this mighty wreck that was battling us every inch of the way. As Powell often put it, "It's hand-to-hand combat all the way, Bubba!"

Bob and I slept like logs that night and the next day woke up to another problem. Chris wasn't feeling well due to cuts on his hands that had become infected, and couldn't leave the habitat. Both he and Don had never really had the proper rest they required before going into saturation and it was now beginning to show. They were supposed to work and sleep in four hour shifts. The length of time they could spend on the project was limited of course, due to the high costs in keeping 26 personnel and an 85 foot support vessel on site, so it was imperative that they put in lots of working time.

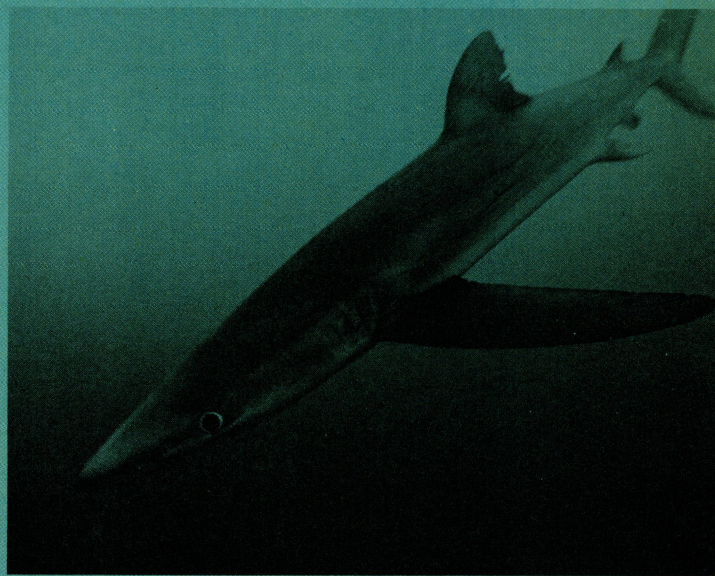
Another diver was needed to go into saturation. With an additional person, one man could remain in *Mother* to monitor the habitat complex while the other two worked. On one dive, while both Chris and Don had been out on an excursion, *Mother* had started to flood slightly due to a gas leak somewhere. Chris just happened to notice it

when he glanced back over his shoulder. "Look at what's happening to *Mother*!!," Chris shouted to Don over the communications set. Don beat a hasty retreat back to the complex and made the necessary valve adjustments to prevent her from taking on a lot of water. A third man would have prevented that from happening.

After a lot of debate and discussion, it was decided that Hollis would saturate. Bob had welding and cutting experience and had proved himself as an excellent diver, making the right decisions when needed, and performing very well underwater. It would also allow our film team to get some much needed footage of what was going on down below. We just weren't making it diving from the surface. John, Tim, and I could transfer freshly loaded cameras and charged lights to Bob who could grind away the footage when he wasn't cutting on the deck. On Sunday, August 12, Coffey, Clark, and I accompanied Hollis to the bottom where he went into saturation.

We finally devised a method of delivering the transfer capsule to the divers down below by shackling it onto the mooring line and letting it slide down to the wreck. On one occasion, when Rodocker was waiting for the pot to come down, he went for a stroll along the promenade deck and got into the winter garden area. There in a corner, with just the rims outlined under the silt, were some silver serving platters and a bottle of French perfume. Don scooped them up — the first treasure yielded by the *Doria*. Although the platters had long since lost their

Blue sharks were frequent visitors to the divers on the Doria.



photograph by John Clark

silver plating, they served to bolster the crew's morale for a time and instilled new incentive in everyone.

One night at about 9 p.m. Bob was out on the hull cutting through the doors. Wherever he touched the torch to the metal, a pool of light bathed his hands and helmeted face in an orange glow. Gas bubbles belched and billowed into the surrounding black water. Hundreds of milling fish were attracted to the spectacle and formed a living igloo around him. Every once in awhile Bob would hold up his hand light, and as far as his beam could penetrate, there were walls of hake and cod.

Some of the hake propped themselves up on their barbels just inches from the orange cutting light and hypnotized, stared at it. Other smaller fish darted in nip-

ping at the O₂ bubbles and banged into Bob's mask. Hollis was the very core of all this activity on the 700 foot long hull, which was blanketed in Russian fishing nets. And not more than 20 feet away one of the nets was still fishing. On one occasion, Bob had swum through the fish igloo and witnessed a frightening sight. Scores of fish were hurtling into the net, getting caught and dying right before his eyes. The next day, there wasn't any sign of the fish in the nets. The sharks had come in during the night and feasted at this macabre scene. Bob felt very much alone. He bent low to the hull over his little pool of orange light and kept on sawing through the doors.

Don McMillan's leave was up and he had to go back to naval duty, so Kris Green, a young Navy doctor from Philadelphia joined the expedition. Doc Green made a house call down to *Mother* to see how Chris was doing. and shortly after that Chris was back in good working shape. Don and Bob finally cut through the doors, which weighed 400 pounds, and wrestled them away from the opening. There was a lot of cheering on board the *Narragansett* when George announced the momentous occasion. It had taken five days to cut a four foot square hole through the hull, (at least two of those days had been lost due to numerous breaks in the welding lead occurring when it became fouled in the wreck and wrapped around the mooring line) but the doors to the *Andrea Doria* treasure vaults were finally opened!

Chris made the first excursion into the dark hole. He slipped down inside with a hand light intending to explore aft. Don tended him from the opening, paying out Chris' umbilical as he slowly sank. But what he found was a heartbreaking sight. After thousands of man hours, a year and a half of planning and building, and thousands of dollars to get this far, Chris discovered a complete wipe-out. On either side of him the bulkheads and walls had long since collapsed into almost unrecognizable shapes.

Chris played his light over four bulkheads piled on top of each other. They were just tenuously hanging there by electrical wires and conduit. Chris touched them and they started to swing gently in the still waters inside the hull. At one point he could touch the ceiling of the foyer by standing on the deck. The distance was about seven feet. The ceiling, which appeared to be made out of plywood, seemed to be in fairly good shape but was also slowly settling in. It was a death trap. Chris got to about amidships, then returned to the opening to discuss the situation with Don. It was Wednesday, August 15.

The two divers decided that Don would descend and explore into another area. I happened to be in the control van at the time of Don's descent, taping the conversation between George, Chris, and Don, when trouble developed. Communications were garbled and it sounded as though Don was hollering over the phones, "It's caving in! It's caving in!"

When George told Chris to assist Don there was no reply. It got pretty tense for a moment with George hollering into the mike and getting garbled noises in return. What had actually happened was this:

The divers were supplied their helium-oxygen breathing mixture from the push-pull compressor on board the *Narragansett*. The system was designed so that the two divers had to stay at approximately the same depth to prevent too great a differential pressure (DP) in their exhaust hoses. Chris and Don were limited to about 30 feet in depth separation. It was especially important to maintain the correct DP for the deeper diver so he could maintain his breathing on a closed loop circuit and not exhaust bubbles which would loosen a lot of silt and

debris over top of the diver and obscure his vision.

Due to the excitement of finally getting down inside the wreck, Don had continued his descent, separating himself and Chris by more than 20 feet. The vacuum in Chris' exhaust hose had gradually reversed and had become greater than the surrounding ambient pressure. The exhaust regulator on the diver's band mask is not designed to handle that kind of pressure — it's designed to take a vacuum. Also it's quite normal to have anywhere from 10 to 25 feet of water in this hose due to a diver cleaning small amounts of water from his mask.

Chris had heard a sharp sound and instantly his mask had completely flooded. Retaining one hand on Don's umbilical line, Chris opened the free flow valve on the band mask and held his head up so his nose was out of the water — all the while trying to haul Don up out of the hole. It was at this point that Don had communicated to George that all of the walls and bulkheads "had caved in." George understood him to say that "they were caving in." When his mask flooded, Chris opened the exhaust valve and had gone on open circuit — hence the noisy, garbled communications.

George was beside himself in the van because he didn't know what was happening and thought he was losing a diver. Don was heavy and had great difficulty swimming up to the opening, looping his umbilical behind him. At the same time Chris tried doggedly to pull Don up as best he could. When Don finally made it up, he unsnapped Chris' quick release on his exhaust hose and instantly Chris was able to completely clear his mask. (Since that mishap, Chris and Don have designed a regulator that will allow two divers, breathing off the same system, to work at almost any depth differential.)

Following is Don's account of the dive:

"Both Chris and I were naturally a bit apprehensive about making an excursion inside, but it was my turn so I dropped through the opening and Chris lowered me slowly down.

"On my descent I could see the tiled deck. Most of the tiles had fallen off and there were only a few remaining over the undercovering. I made a ten foot excursion to either side; it looked like a disaster area and was pretty dangerous to go poking around in the stuff. The water was fairly clear inside, but there was a lot of sediment on everything and it would have been impossible to see anything if I had been on open circuit. The bubbles would have dislodged the sediment from overhead making visibility nil.

"I continued on down, playing my light over the rubble, and discovered a room still intact — also a set of stairs. The walls of this room must have been made of metal. The glass was still intact, too. It was the jewelry shop! I got to within ten feet of it and could see mud circled in the corners of the windows, just like snow on glass panes in the winter time. But I couldn't see a thing on the inside.

"Immediately above me, on the edge of the jewelry shop, was a pile of debris precariously supported by only a couple of small timbers which had fallen and propped themselves against the wall. I realized that if my umbilical brushed against any of it, it could have collapsed and buried me alive. I couldn't get any closer than ten feet."

At a depth of 220 feet Don shined his light down to the bottom and discovered the debris to be the home for hundreds of crabs. "They were a pretty good size — about five to six inches across the body. And then my light picked up one of the weirdest creatures I've ever seen underwater. It was furry like a caterpillar, had a

fluorescent orange head and an orange body and was spiraling itself through the water." (I later asked Don if he was narced when he saw this critter, but he said that he was in complete control of all his faculties.)

Don's total time down in the hold was about ten minutes. It was only about half a minute after he had hit the 220 foot mark that he had realized Chris was in trouble. At that point Don immediately swam up to the opening where he disconnected Chris' exhaust hose.

The possibility of the interior of the ship being in bad shape had been discussed by Don and Chris and some of the other members of SSI. However, dreams and wishful thinking tend to obscure negative thinking at times, resulting in building grand and glorious castles in one's imagination. I had gotten to the point where I actually anticipated drifting down into the foyer area with my hand light, picking up the remains of picture frames on the walls, playing with the combination on the pursers safe, and filming Don and Chris plucking silver relief plaques off the chapel wall like apples from off a tree. And I'm sure everyone else had this sort of a vision built up in his imagination.

But the idea that the interior of the *Doria* would be completely devastated, and in such a bad state of affairs, had obviously never occurred to anyone. Chris and Don had studied other ocean liners, including the *Queen Mary*, and had found that the walls were made of metal with a wood or veneer paneling on either side. That was standard procedure to prevent fire from spreading should it break out aboard ship. The *Doria* happened to be one of the first ships to do away with the metal partitions and used a new type of non-metallic insulation between two wood wall panels.

It's possible that valuable things could be reaped from the *Doria's* jumbled mess, but it would involve another costly expedition with divers utilizing diving armour such as that used by the Italian Sorima Salvage Co. to recover almost £1,000,000 in gold and silver bars and coins from the *Egypt*, which sank on May 20, 1922, on its way from London to Bombay.

Tons of rubble and debris would have to be moved, and the upper areas would have to be cleared of the swinging bulkheads and walls, held there by the electrical wires, to make the wreck safe enough for divers to work inside. This could be done by dropping a small explosive charge down in the hold and then digging through the rubble once it settled, but it just wouldn't be practical for a large scale expedition to undertake this. For the small return that divers would be able to wrest from this rubble, they'd be lucky to break even.

Chris and Don had anticipated salvaging a minimum of \$2,000,000 out of the *Doria*, but that would have been possible only if the interior of the ship had been in reasonably good condition. The handwriting was clearly on the wall. The entire expedition had been at sea for 23 days. We had two scheduled days left, but upon discovering what the interior of the ship was like and with a report of bad weather heading our way, George wisely decided to bring *Mother* to the surface, head back to port and to call an end to the expedition. It just wasn't worth risking the divers' lives for the little they might be able to salvage in the remaining two days.

Tony Eidson, Tim Kelly, John Clark and I made the last and final dive on the *Doria* to cut *Mother* loose and ride her up to the surface. Dave LeJune and Bob Coffey were waiting there to secure *Mother's* towing bridle to the *Narragansett's* tow line. It took about 26 hours to tow *Mother* back to Fairhaven and all the while Don, Bob

and Chris were inside the habitat decompressing.

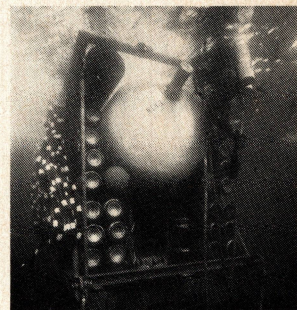
Instead of the standard U.S. Navy ascent rate for saturation divers during decompression, George Powell, Kris Green and Don McMillan developed a new set of tables which allowed them to cut the ascent time by half. Rather than taking 63 hours to make it back to the surface, the divers made the ascent in a record 30 hours.

At 8:25 p.m. on Friday, August 17, 1973, the hatch on *Mother* was opened and Chris, Don and Bob stepped out into the glare of camera lights and a barrage of cheering spectators, reporters and photographers. Waiting there to greet them were their proud wives. The expedition had cost somewhere in the vicinity of \$150,000 and was financed totally by private investors. Although the salvage attempt was a failure in wresting riches enough from the *Doria* to provide an instant monetary return for the investors, and for Sat Systems to be in the black, it nevertheless was a smashing success in other ways.

Rodocker and DeLucchi had nothing more to go on than a dream, a good education and the courage to jump in with both feet heavily weighted. They proved that their system works. A complete saturation complex had been transported 3000 miles across country, towed 80 miles out to sea, and with a great deal of difficulty, submerged 160 feet to a wreck. Two divers were saturated for 191.07 hours and a third diver for 91.04 hours, then brought safely back to the surface. That in itself was remarkable!

photograph by John Clark

At right, *Mother* just before being lowered to the bottom. Below, Barbara and Don Rodocker, and Sue and Chris DeLucchi visit just before the men moved into *Mother*, where they stayed for a duration of 191 hours. They have spent more submerged time on the *Andrea Doria* than any other divers in the world.



photograph by Bernie Campoli

Since then, Sat Systems have had numerous salvage job offers ranging from the salvaging of other wrecks off the east coast and in Lake Superior to a sunken ship off Japan worth \$50,000,000. And there is a good possibility that a handful of us will be saturating 12 miles off the south coast of Ireland next year to film the fabled *Lusitania*.

And you know, the expedition really wasn't a total financial wipeout. After all, the trio did bring up a bottle of good French perfume worth \$150,000. Anyone interested in buying an expensive gift for his favorite lady? I can put you in touch with the right people . . .

AQUATIC ANOMALIES

THE OCEANS' EARLY WARNING SYSTEM

By Bill Barada

This month's article is based on an 84 page report titled, The Relation of Aquatic Anomalies to the Marine Environment with Special References to Florida. The report was prepared by Bill Barada and William Partington, Jr. of the Environmental Information Center of the Florida Conservation Foundation for the Division of Marine Fisheries of the Florida Department of Natural Resources and the Florida Audubon Society. The final report is documented by 95 cited references.

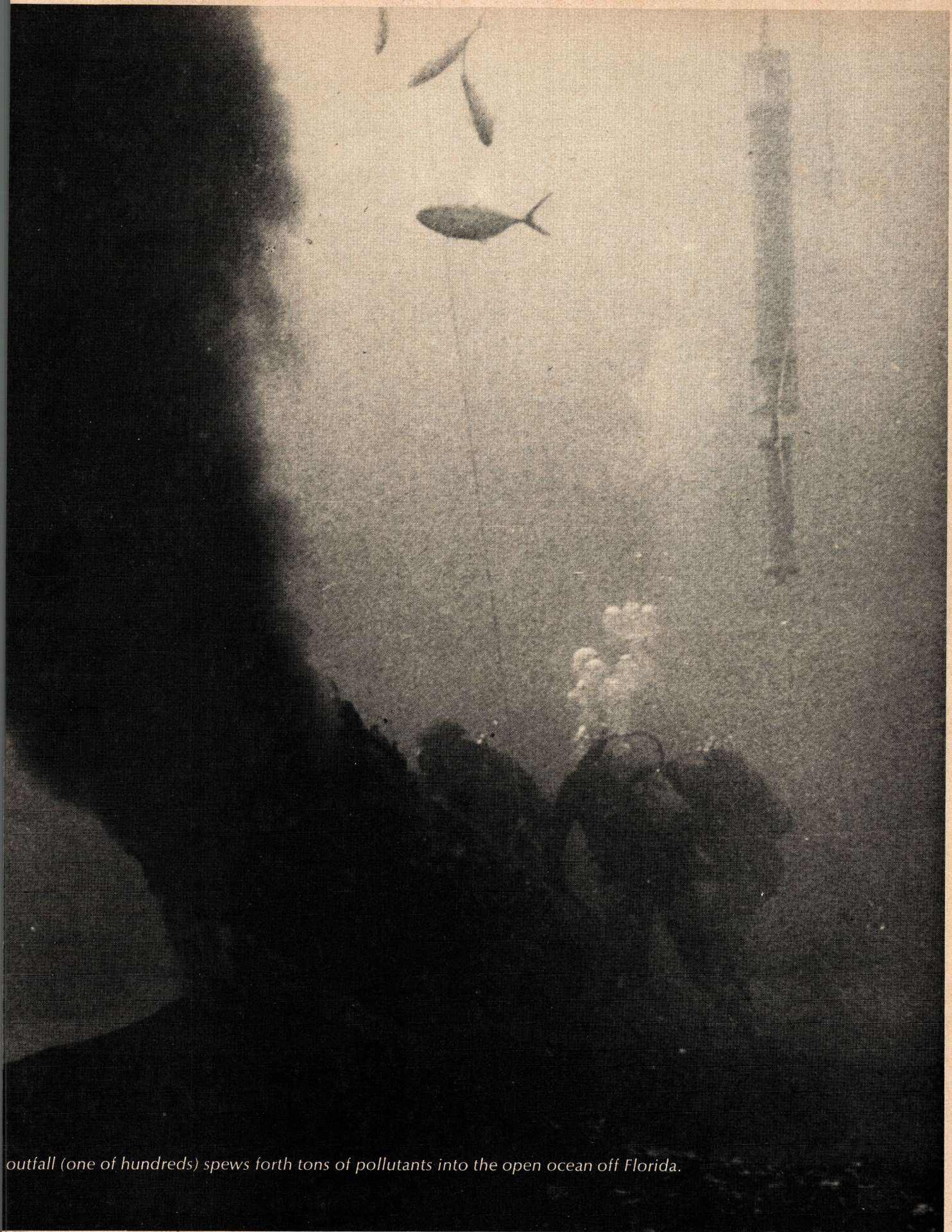
A few years ago I began collecting stories of unusual and abnormal phenomena in the oceans. The file was labeled "Aquatic Anomalies" and into it went hundreds of fascinating, unfinished stories such as:

Sea birds along the Atlantic coast of Florida were observed flying erratically, as if drunk or dizzy, before plunging helplessly into the sea. The carcasses of hundreds of loons, pelicans, and cormorants were found washed to shore or floating in the surf. The cause of death was identified as a bacteria or virus infection, and the phenomena has become an annual occurrence.

Hundreds of sick and dying sea lions crawled, or washed onto California beaches. Some traveled as far as a mile inland before dying. The cause of death was



One sewage



outfall (one of hundreds) spews forth tons of pollutants into the open ocean off Florida.

photograph by Robert Rosof



photograph by Jack McKenney

identified as leptospirosis, a disease found in cattle.

A massive fish kill occurred in a relatively unspoiled area of south Florida in which the fish went into weird "tail spins" just before they died. The cause of death was attributed to blue-green algae.

An abnormal number of dead porpoises washed ashore in the Gulf of Mexico in the vicinity of the Mississippi River outlet. An unknown marine disease is suspected and officials state the anomaly may be related to recent spring flooding.

Fish-killing red tides appeared in areas where it had never before been recorded. Such phenomena were reported from all over the world, including New Jersey, California, Japan, European countries. Cause unknown.

The list goes on and on, almost endlessly, thousands of interesting odds and ends of apparently unrelated information. Recently, however, in an investigation sponsored by the Florida Department of Natural Resources and the Florida Audubon Society, these fragmented bits and pieces were condensed into a single report and evaluated in the light of existing knowledge. When the pieces of the aqua-

tic anomalies puzzle are all put together and the blank spaces filled with information gleaned from hundreds of scientific reports a frightening picture comes into focus.

There is ample evidence to show that these anomalies are practically all the result of pollution. They are the oceans' early warning system which is flashing signals of a serious illness that will become progressively worse and possibly fatal if the symptoms are not recognized and the basic illness treated. Yet, present pollution control laws and water quality criteria completely ignore these anomalies as evidence of pollution, which makes it virtually impossible to obtain "proof" of pollution damage that will stand up in court.

As an example, on September 5, 1971, Escambia Chemical Company dumped 29,500 pounds of nitrogen compounds (10 times its normal daily discharge) into Escambia Bay, Florida. (SDM Feb. '72). For the next 11 days the waters of the bay vomited dead and rotting fish in a continuous, gigantic slaughter. Three days after the chemical discharge fishermen discovered that their million-dollar-a-year oyster industry was wiped out. All of the oyster had been killed.

However, the direct cause of the fish kill was determined as a lack of oxygen in the water, and the direct cause of the oyster kill was a fungus infection. As a result, the Florida Pollution Control Board and the Federal Environmental Protection Agency stated there was not enough scientific evidence to prove that the discharge by Escambia Chemical Co. caused the damage. David Levin, chairman of the FPC, is reported as having said, "I don't think the evidence presented here would stand up in court."

A more recent example occurred in 1973 when Environmental Protection Agency (EPA) investigators gave south Florida's raw sewage outfalls a clean bill of health. An Environmental Impact Statement prepared by the federal agency stated, "Ocean outfalls have been used to dispose of untreated and partially treated sanitary sewage from populated areas of southeast Florida for over 30 years. Based on recent studies, it was found that there are no detectable adverse effects beyond the small zone at the end of the outfall pipe. There is no evidence of cumulative adverse effects resulting from discharges of untreated wastes."

Every sport diver and diving scientist who has explored these reefs for the past five or ten years can testify

that there have been obvious "cumulative adverse effects." The problem is that these changes in the reefs' composition have not been documented. No scientific studies have been made of the reef ecology, and careful, systematic observations and photographs recording the gradual deterioration are not available. Consequently, EPA investigators had no baseline data against which the damage could be assessed. They were in the same position as inland divers looking at reefs for the first time: everything looked "normal."

It is doubtful, however, that even if documented evidence of reef deterioration had been available, it would have changed EPA conclusions. Such evidence is not accepted as "proof" of pollution-caused damage. The EPA statement regarding the significance of an abundance of abnormal fish clearly illustrates the official attitude.

The EPA impact statement reported, "All of the ocean outfalls had tremendous fish populations. Fish taken from the Hollywood outfall, an artificial reef, and a natural reef were examined for unusual signs of abnormalities. All fish taken from the artificial reef and the Hollywood outfall showed signs of 'fin rot' while those taken from the natural reef were normal. Since 'fin rot' was also found on the artificial reef, it cannot be concluded that constituents in the waste were solely responsible." (emphasis added).

It also sure as the devil cannot be concluded that outfalls are *not* responsible. If the investigators had bothered to check the fish from all Florida outfalls they would no doubt have found abnormal fish around these also, just as sick fish have been found in the vicinity of outfalls all over the world.

Experiments at the EPA's own Gulf Breeze Marine Laboratory have produced fin rot and other fish diseases by exposing them to sea water contaminated with various industrial chemicals. When pinfish and spot were exposed to sea water contaminated with PCB's (polychlorinated biphenyls, a widely distributed industrial chemical similar in structure to chlorinated hydrocarbon insecticides such as DDT, but more toxic), the fish became infected with fungus-like lesions, hemorrhaging and ragged fins. All control fish remained healthy.

Yet the EPA and pollution control agencies throughout the United States and across the world do not accept this, and other overwhelming evidence, as "proof" of pollution-caused damage. The suspected reason that well documented scientific evidence of pollu-

tion damage to marine life is ignored is that accepting such evidence would destroy the antiquated, discredited concept that the ocean has an almost unlimited capacity for "dilution" of human waste.

Overwhelming evidence exists that the dilution of waste effluent in the ocean, upon which all present pollution control laws are based, is a logical fallacy unsupported by facts.

Remigio Valido of the Ocean Society, in testimony before the California Water Resources Control Board in 1971, stated, "The trace metals (copper, zinc, cobalt, chromium, arsenic, molybdenum, silenium, mercury, cadmium, lead), the pesticides and herbicides in addition to untold numbers and varieties of inorganic and organic compounds, react or involve themselves in untold numbers of complex hydrochemistries, ion exchange processes, reconcentrations, etc., which are suspect. In fact what we do know about these toxic persistent compounds is that they do not become diluted — they accumulate and become concentrated in the ecosystem."

The present method of measuring marine pollution is to lump these thousands of toxic compounds together with organic material and evaluate the effect of this witches' brew on water quality in terms of biochemical oxygen demand (BOD) and dissolved oxygen (DO). This is based on the assumption that the effluent mixes readily with salt water and that all of these compounds are "stabilized" by biochemical processes in the sea. As long as the water column contains enough oxygen to sustain life, it is usually considered capable of accepting more pollution.

Mixing in the ocean, and thereby adequate dilution, is a very slow process. There are hundreds of distinct water masses in the oceans that maintain their identity over hundreds of years. Freshwater aquifers are maintained below sea level and prevent saltwater intrusion for indefinite periods because fresh and salt water do not mix readily. Stratification layers between fresh and salt water can be observed wherever large rivers flow into the sea.

Research at the EPA Gulf Stream Laboratory demonstrated that pesticides absorbed on particulate matter are transported by rivers, storm drains and sewers to the ocean and that the difference in solubilities of these compounds in fresh and salt water result in precipitation and deposition in bottom sediments. Thus large quan-

ties of toxic substances which do not show up in routine water analysis remain undetected, and they raise havoc with bottom organisms.

E. F. Corcoran of the University of Miami Marine Laboratory found that fresh water flows over the surface of salt water in much the same manner that it does on land. It forms a thin film, or slick, which spreads for long distances over the surface of the ocean. Studies by D. B. Seba and Corcoran found that pesticides and bacteria are absorbed by floating organic matter and concentrated in surface slicks. They found up to 137 fold concentrations of pesticides and up to 1500 fold concentrations of particulate matter in slicks as compared to other ocean water. Slicks are also areas of very high biological activity. Plankton, game fish, bait fish and seabirds concentrate in and under the surface slicks to feed on the organic material and each other.



photograph by Bruce Monier

It seems logical that the concentration of toxic substances, bacteria and viruses in surface slicks is responsible for many of the bacteria-caused seabird kills, bacteria and virus caused fish kills, and abnormal population explosions of plankton and algae which are associated with many of the red tides. However, a review of the literature disclosed no studies of surface slicks in conjunction with these anomalies.

It appears obvious that new criteria must be established to indicate the degree and extent of pollution in the marine environment. Investigations which do not include an analysis of surface slicks, bottom sediments, changes in benthic organisms and other marine life are meaningless.

Skin divers can play a vital role in helping to document many of these early warning symptoms of pollution.

The warning signals are not difficult to recognize once you become aware of what to look for and understand the implications of what you find. Skin divers can certainly notice an abnormal increase in the populations of such things as sea urchins, blue-green algae, polychaet worms and similar stress resistant organisms. They can also notice depletion of kelp beds, sea grass beds and other sensitive species. The observations of shell collectors would be particularly valuable because scientists already have knowledge of population distribution of these organisms. Studies have shown that mollusks are excellent pollution indicators because predator shells, and a few others, require a wide diversity of other species as a food supply. Studies in Florida showed that changes in mollusk populations indicated the same degree of pollution as comprehensive ecological studies.

Casual observations, however, are

not enough to do any good. What is needed are careful and systematic observations and photographs which document the changes. Most marine scientists are more than willing to assist and guide such efforts. They can tell you what to look for, how to establish methods of recording and counting marine populations, how to make sequential photographs of the same area, and how to identify and interpret your observations.

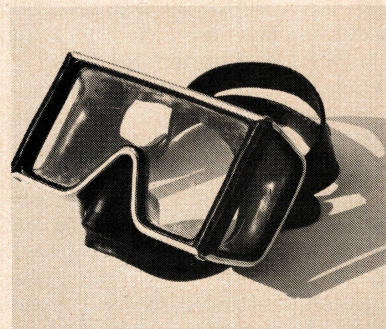
This kind of evidence may not "prove" what caused the damage, but, if only a few of us old-timers had taken the trouble to document the changes during the last 20 years, those records would be invaluable in demonstrating the progress of pollution damage today. This project is strictly up to skin divers. It's our world and nobody else either can or will do the job for us. >

The high new Monterey boot was designed to give the diver added warmth and protection, swimming comfort and walking ease. They have hard rubber soles, molded for right and left foot, to give non-skid walking on boat decks or beaches. The soft, flexible top of the boot is made of 3/16 inch rubber, fully lined and sewn. \$19.95. Contact: Del Mar Supplies, 427 W. Palmyra St., Orange, Calif. 92666.

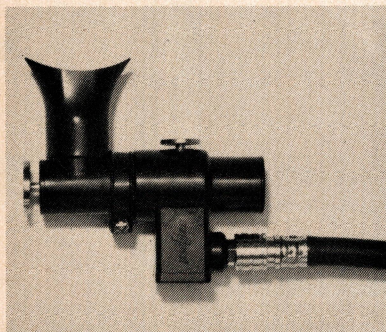


The Sherpa OPS is a Swiss made diving watch which is used by military divers in many countries. Tough, stainless steel case has been tested watertight to 20 ATMS. Self-winding 17 jewel movements has incabloc shock protection and an automatic calendar. Elapsed time bezel is internal, operated by external crown with safety clutch. \$125. Contact: Chronosport, 135 Rowayton Ave., Rowayton, Conn.

The Peri-Vision mask from White Stag has low volume, double seal, stainless steel fittings, and a heavy duty strap. It is comfortable and light, with maximum vision. The protruding nose pocket is easy to grip for quick pressure equalization. The lens is tempered glass. \$20.00. Contact: White Stag Water Sports, 1046 Princeton Drive, Marina Del Mar, California 90291.

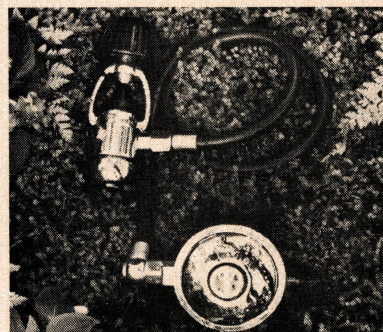


The latest concept in vest inflators by Sea Quest provides fast, controlled vest inflation. For safety, oral inflation and vent control have a different location than mechanical inflation control. Model #9430 (shown) is complete with mouth piece and oral inflation valve: \$32.95. Model #9431 includes L/P hose and two hose clamps: \$26.95. Contact: Sea Quest, 11525 Sorrento Valley Road, San Diego, Calif.

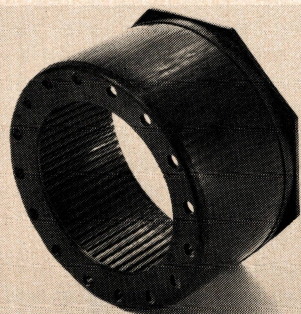


A new design in buoyancy compensators, the Ed Brawley Buoyancy Pillow provides buoyancy where you want it for perfect balance and control. Features complete freedom of movement with no restricting collar, adjustable straps, easy-to-find inflator hose and a large gauge pocket. Retail price \$70. Contact: Ed Brawley, 2209 S. El Camino Real, San Mateo, California.

The U.S. Divers' Conshelf XII regulator is now available with a right-angle swivel attachment of the air hose to the second stage. The new swivel permits the hose to be routed under the arm instead of over the shoulder giving greater freedom of movement. All other features are the same as the 1081 Conshelf XII. \$115.95. Contact: U.S. Divers Co., 3323 W. Warner Ave., Santa Ana, Calif. 92702.



Divers' Nofog is a new anti-fog, anti-static product being produced by Skico, Inc. Divers who treat their masks with Nofog prior to entering the water find the mask resistant to fog for an entire day or more. It is practical to carry and easy to apply. A quarter-ounce plastic bottle of Nofog retails for \$1. Contact: Nofog Sales, P.O. Box One, Cheney, Washington 99004.



Aqua-Craft's underwater kinetics self-draining, non-rolling tank boot is now available for the protection of aluminum tanks. Made with scuff resistant plastic, the boot provides extra long wear and protection for flat bottom aluminum tanks. The 6.9 inch diameter boot is available at pro dive shops for \$3.95. Contact: Aqua-Craft, 5258 Anna Street, San Diego, Calif.

Designed for the discriminating diver, there is a new, long-wearing boot from U.S. Divers. The contoured neoprene rubber sole features a sure-grip surface. The textured nylon upper portion offers comfort and exacting fit. Available in sizes small, medium or large; in 3/16 inch rubber for \$15.95 pr., or 1/4 inch rubber for \$16.95 pr. Contact: U.S. Divers, 3323 W. Warner Ave., Santa Ana, Calif.

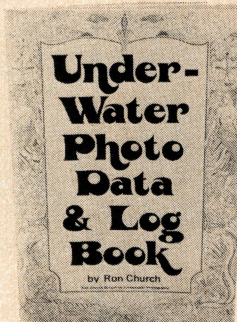


How many times have you struggled with your fin heel straps, trying to get them off underwater? Struggle no more. The Fin Flipper provides a handy tab to grab so you can get your fins off easily, even when encumbered with clumsy gloves. Fin Flippers come packaged in pairs at \$.69 per pair. Contact: Aqua-Craft, 5258 Anna St., San Diego, California 92110.

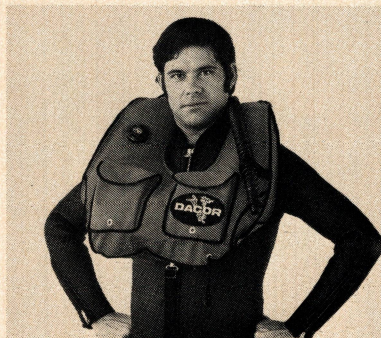
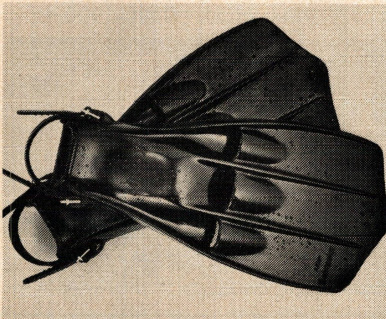


New Gear

The Underwater Photo Data Book, by Ron Church, was designed to give you the fundamentals in underwater photo recording so that you can profit from your U/W tests and divergent photo activities. It also has many valuable how-to tips on key factors of U/W photography. Priced at \$3.50. Contact: Ron Church Productions, P.O. Box 1163, La Jolla, Calif. 92037.



New "flow-through" Mark X fins from AMF Swimaster are designed to meet the propulsion needs of advanced sport divers. Extra-large oval jet vents are dynamically located to help reduce pressure drag by as much as 30 percent over conventional fins. They feature a heavy, positive-lock, adjustable heel strap. \$22 per pair. Contact: AMF Swimaster, 3801 South Harbor Blvd., Santa Ana, California 92704.

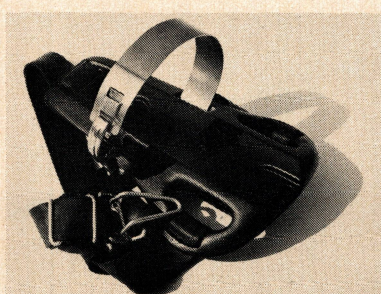
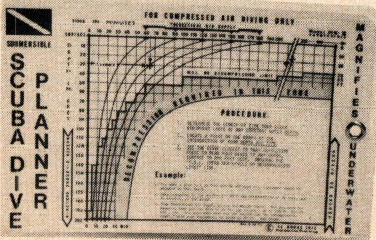


The new Model CV-50 buoyancy compensator vest from Dacor has many fine features including automatic relief valve, true spiral inflation hose, new "kiwi" harness which eliminates the waist strap, twin gusseted pockets, abrasion panel, gusseted vest body and drain. Comes with single 25 gram cartridge. \$75. Contact: Dacor, 151 Northfield Rd., Northfield, Illinois.

A turtleneck accessory for your wet suit. Simply slip it over your head and wear it under your jacket. Provides additional warmth to shoulder and neck areas. Promotes a better water seal, and adds a distinctive look to your dive suit. The neck may be rolled, folded or adjusted to suit your needs. \$9.95. Contact: Sea Suits, 825 W. 18 St., Costa Mesa, Calif. 92627.



The submersible Scuba Dive Planner is a simplified graphic presentation of any individual diver's theoretical air consumption, plotted against the no-decompression limits for depths from the surface to 200 feet. It is designed to attach to diving equipment so that the diver can use it underwater after the bottom depth is known. Retail for \$2.25. Contact: Planner, P.O. Box 478, San Lorenzo, Calif. 94580.

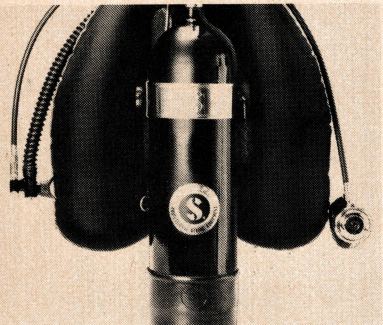


The Super Stag Backpack is now available with neoprene rubber webbing for diver comfort in and out of the water. Ideal for use without wet suit protection, and eliminates most wear on wet suits. Utilizes Spring-Lok adjustable band assuring positive no-slip hold on cylinder at all times. Priced at \$28. Contact: White Stag Water Sports, 1046 Princeton Drive, Marina Del Rey, California 90291.

O'Neill Inc. has created the inflatable SuperSuit, a one piece suit of Rubatex neoprene rubber that seals about the wrists, ankles and neck. Opening into SuperSuit is closed with a gas tight shoulder-to-shoulder zipper. SuperSuit's inflatable capacity affords the diver comfort, buoyancy control and warmth. \$250. Contact: O'Neill, 1071 41 Ave., Santa Cruz, California.

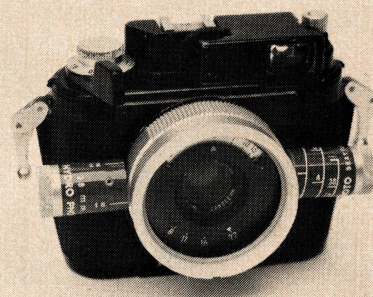


To counteract the critical phenomenon of buoyancy loss, Scubapro has developed the Buoyancy Control Pack, or BCP. The BCP allows the diver to offset the negative buoyancy of suit compression or give added buoyancy needed in lifting heavy objects or surface cruising. Integral quick-disconnect inflator for push-button control. \$160. Contact: Scubapro, 3105 E. Harcourt, Compton, Calif. 90221.

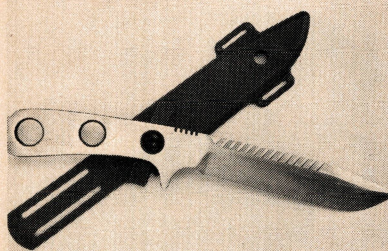


The new B.C. I by U.S. Divers offers an inner-bladder, outer-bag design that makes these among the strongest, most reliable and durable buoyancy compensators on the market. A triple function relief valve automatically controls over-pressurization and, when the lanyard is pulled, controls buoyancy trim and deflation. Available in yellow or black for \$75. Contact: U.S. Divers, 3323 W. Warner Ave., Santa Ana, Calif. 92702.

Hydro Photo has come out with sets of graduated lens knobs for Nikonos 28 and 35mm lenses. Made of anodized aluminum, the knobs are longer and bigger in diameter than the Nikonos knobs, with a knurled end for easy gripping. The distance and f-stop settings are printed on a red decal with white markings for easy reading. \$7. Contact: Hydro Photo, 3909 13th S., Seattle, Washington 98108.



The Chael III Diver's Companion is a multipurpose knife that can cut pipe, rope, wood or a variety of other materials: the back of the blade is serrated for sawing; the back of the handle has a claw for prying. Made of 440C stainless steel, the knives have lifetime guarantee. Retail price is \$35. Contact: Bowen Knife Co., P. O. Box 14028, Atlanta, Georgia 30324.

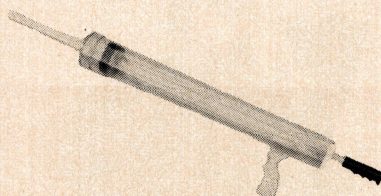


The Aqua-scope bottom viewer from Bayfront Industries in Florida, is just the thing for divers in small boats who are surveying new diving areas. Made of styrofoam so it will float if dropped, it is molded to fit the face on top and has safety glass on the bottom. Price is \$7.95. Contact: Bayfront Industries, Inc., 4225 Ponce de Leon Blvd., Coral Gables, Florida 33146.

Specialty Sports Supply — makers of novelty divers' items including divers' glassware, lounge suits, equipment branders and beach towels — now have 1974 dive poster calendars. Printed in a year-at-a-glance format, the calendars can be printed with club, dealer or resort names. \$2.95 for one, with quantity discounts up to 50 percent off for 500 or more. Contact: Specialty Sports Supply, Box 1737, Hollywood, Calif. 90028.

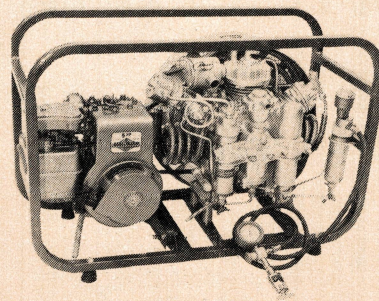


A new chemical light called Cyalume creates no sparks, no flames, no fumes and requires no batteries. Designed for use in hazardous places such as caves, etc., it is completely waterproof and can be used underwater for up to three hours with light bright enough to read by. Four for \$4. Contact: Glendale Optical Co., 130 Crossway Park Dr., Woodbury, New York 11797.

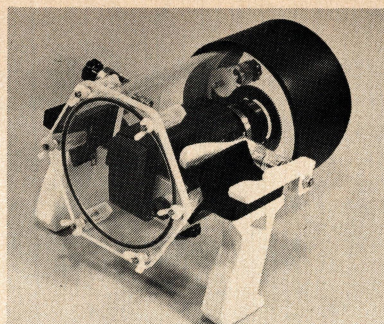
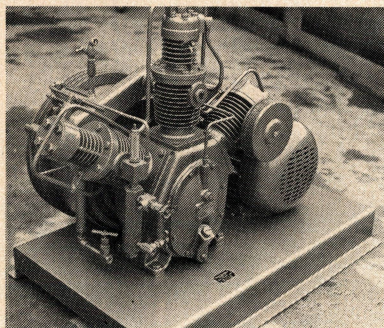


Bayfront Industries has developed a line of slurp guns to help divers catch small fish for their saltwater aquariums. The Master, shown, is 35½ inches long with a 3¼ inch tube diameter and costs \$24.95. All of the guns are made of tough plexiglass and work on the suction principle. Contact: Bayfront Industries, 4225 Ponce de Leon Blvd., Coral Gables, Florida.

Mako Engineering now offers specialized portable machines featuring tubular framework surrounding the entire compressor package. This tube work is being featured on the portable machines K-13 and K-51 for added lightness, protection of the compressor package during shipping, and ease in handling. Contact: Mako Engineering, 3131 N.E. 188 St., Miami, Florida.

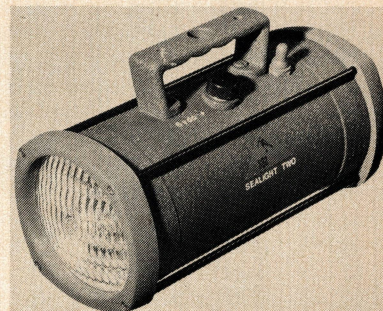


Worthington and Ingersoll-Rand high pressure air compressor plants, from 3000 to 5000 psi, and from 5 to 100 hp. Complete with filter backup systems. Dew point ranges from -30 to -100 degrees F. Air produced meets Grade 1 medical, California Standard, U. S. Navy Standards. Price ranges from \$2,400. to \$30,000. Contact: McWhorter Engineering Co., P.O. Box 9014, Birmingham, Alabama 35213.

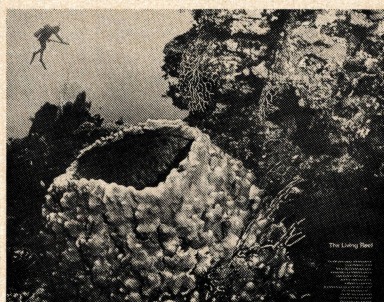
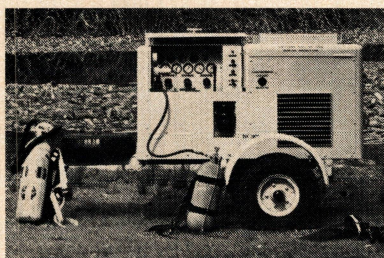


Ryan Products offers a new underwater housing for the Kodak XL-55 super-8 movie camera. The case includes easy to use zoom, focus and shutter controls. The O-ring sealed rear plate is easily removable and allows the film to be changed without removing the camera from the housing. The acrylic housing is extremely strong. Priced at \$79. Contact: Ryan Products, P.O. Box 6506, Columbus, Georgia.

The Sea Light Two is a unique double ended light for the diver/photographer. A diver light of 30 watts (65,000 candle power) burns continuously for over 40 minutes. At the opposite end is a photo light of 100 watts at 3400 degrees Kelvin which allows shooting of up to three rolls of film. May be re-charged hundreds of times from any VDC source. Retail for \$159. Contact: Sea Research & Development. P.O. Box 589, Bartow, Florida.

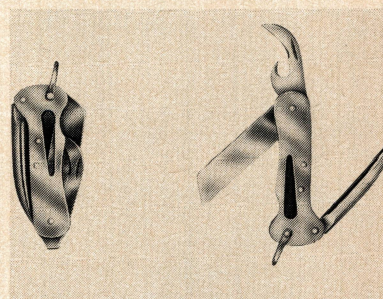


Portable air compressor by Subsea Air Systems, the Subsea 3500, is a rugged, portable, gas driven high pressure air compressor designed for the scuba diver. This unit delivers 15cfm to 3500 psi filling a standard 72 in less than 5 minutes. Other features include automatic unloading and moisture drain, gauges and safety relief valves for all stages. Contact: Subsea Air Systems, 3816 Cheasty Blvd., So., Seattle, Wash. 98108.

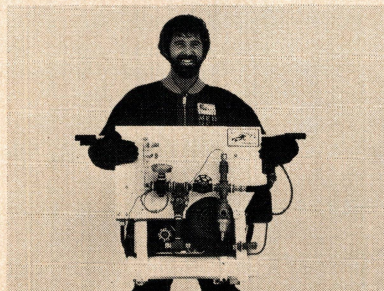


World renowned underwater photographer Jerry Greenberg has turned one of his beautiful pictures into a stunning poster. The full color scene of a coral reef was printed on 24 X 31 inch stock, and was enhanced with the reproduction of a lovely poem by Robert Southley. Retail price is \$5.00. Contact: Seahawk Press, 6840 S.W. 92nd Street, Miami, Florida 33156.

The Yachtsman is the newest and most dramatic addition to the Joseph Rodgers line of unique ideas and craftsmanship in knives. It is made of the highest quality Sheffield stainless steel, has a marlinespike for splicing a rope, combination can opener/screwdriver. \$17.70. Professional Merchandise Center, 220 Fifth Ave., New York.



Diving Unlimited's new Econo Hot Water Diving System brings the warmth and comfort experienced by saturation divers to the small job or contractor at a fraction of the cost. Light in weight (100 pounds) for the total system including suits, hose and heater, make it ideal for pick-up truck operation. Priced from \$1,295. Contact: Diving Unlimited, 1148 Delevan Dr., San Diego, Ca. 92102.



Dynamic balancing and jewel bearings make the oil filled compass from Farallon one of the most accurate U/W navigation compasses available. It can be used at any attitude (need not be level to read). The rotating bezel has 10 degree increments making it easy to read. Entire face is luminescent with black markings. Priced at \$29.95. Contact: Farallon, 1333 Old County Road, Belmont, Calif. 94002.

Dive Power is a new dietary supplement formulated specifically for skin divers. It is designed to provide generous, balanced amounts of the vitamins and minerals that critically affect lung efficiency, heart/artery function and optimum oxygen/CO₂ transport to make you a healthier, safer diver. \$3.95 for a bottle of 30 (one month's supply). Contact: Aqua-Craft, 5258 Anna Street, San Diego, California 92110.



Most ocean oriented people are familiar with the general characteristics of coral reefs, associating the rock-like structures with crystal clear waters and schools of bright tropical fish. They know that during the day these shallow water environments have a lively nature, dressing in gaudy colors with some of the most ecologically active communities on earth. What most people don't know is that when dusk comes, reefs begin to show a different face. Colors become subdued, activity declines and each reef slowly puts on its dark, often mysterious cloak of night. Most divers have long since left the brilliant waters to go home, and are unaware of the changes taking place.

The first question asked by most people who think about night diving on a reef is how animals react to a diver's light. Obviously the fish are used to nearly total darkness at night, and even a small light puts out a disturbingly bright beam. In my experience the major reaction of most fish is to be stunned by the glare — nearly paralyzed in fact. Even fish which are rapid swimmers during the day become practically tame at night. They either remain motionless in the coral where they're sleeping, or swim off slowly in order to avoid the light. A good example is the pufferfish which becomes particularly docile at night.

The common name for the puffers comes from their remarkable ability to inflate themselves when disturbed. This is accomplished through the action of numerous sacs which line their intestine, and inflate the fish by drawing in water or air. At night these fish are so slowed down by the stunning effect of light that it is an easy matter to squeeze one to make it blow up with water. At this point the poor creature is entirely helpless, unable to swim in such a distended condition. Sometimes, however, it will wedge itself in a hole before expanding, a method which serves as protection since it is very difficult to extract the fish from such a hiding place.

Like many reef inhabitants, puffers are territorial and as I have done much of my night diving in particular locations, I have seen the same fish many times. It is amazing how quickly these fish learned to avoid me. When I first started diving in one area and became familiar with certain puffers, they were easy to approach and would immediately inflate when disturbed. However, after a few such encounters,

these same fish made themselves scarce when I intruded upon their sleep. Not only would they quickly exit when they saw my light, but if I was lucky enough to surprise one with a physical encounter, it would refuse to inflate. The creature seemed to learn it was better to simply shift into forward and split.

Another very fascinating thing about night on a reef is how fish sleep. For the most part, the diurnal creatures seek refuge in a niche in the honeycomb-like structure of the coral where they are safe from predators. Some fish, however, are not content to wedge themselves in a hole and doze off. Probably the fishes with the strangest sleeping habits are the parrotfishes. Some of them are known to sleep buried to the mouth in sand. Other species are content to simply prop themselves up against a rock, but don't stand for too much interference with their sleep before swimming off to find another bed.

Most parrotfish that I have seen do something that no other fish do — they sleep in pajamas! Just after settling down in a coral crevice, they secrete a transparent bubble around themselves called a mucous membrane. The function of this filmy envelope is not completely known, but it is assumed that it serves as a protective device to ward off would-be predators. During the secretion of this membrane, the fish conveniently leaves two openings for respiration; one to draw water in through the mouth and the other where water is expelled out the gills. At sunrise, the parrotfish swims out of its protective sac and goes about its business.

It is interesting, when coming upon such a parrotfish, to note its eyes. Being so enclosed, the fish is much less likely to run away from you and it is easy to get right up to the creature. Although asleep, the fish seems to be watching you as, if you start at one side of it and swim to the other, the animal's eyes actually follow you. Like all other fish, the parrotfish lacks eyelids and must sleep with its eyes open. Apparently the sleeping fish is undisturbed by visual messages.

No description of night diving in the tropics would be complete without some mention of one of the world's most beautiful nocturnal fishes, the ornate zebrafish. It is truly a thrill to come across one of these lovely creations in its natural habitat. Beneath the gaudy and or-

nate exterior, however, there lies danger. Each of the spines of the zebrafishes' dorsal, anal and ventral fins contains poison glands. Though the venom is not nearly as toxic as that of the stonefish, for instance, it should be treated with great respect.

There may be some argument as to the nocturnal nature of these fishes as they are often seen during the day. I believe most of these encounters are due to a fish being disturbed up under a ledge, however, or in a crevice where they were sleeping. And an area which contains only a few zebrafish during the day is usually swarming with

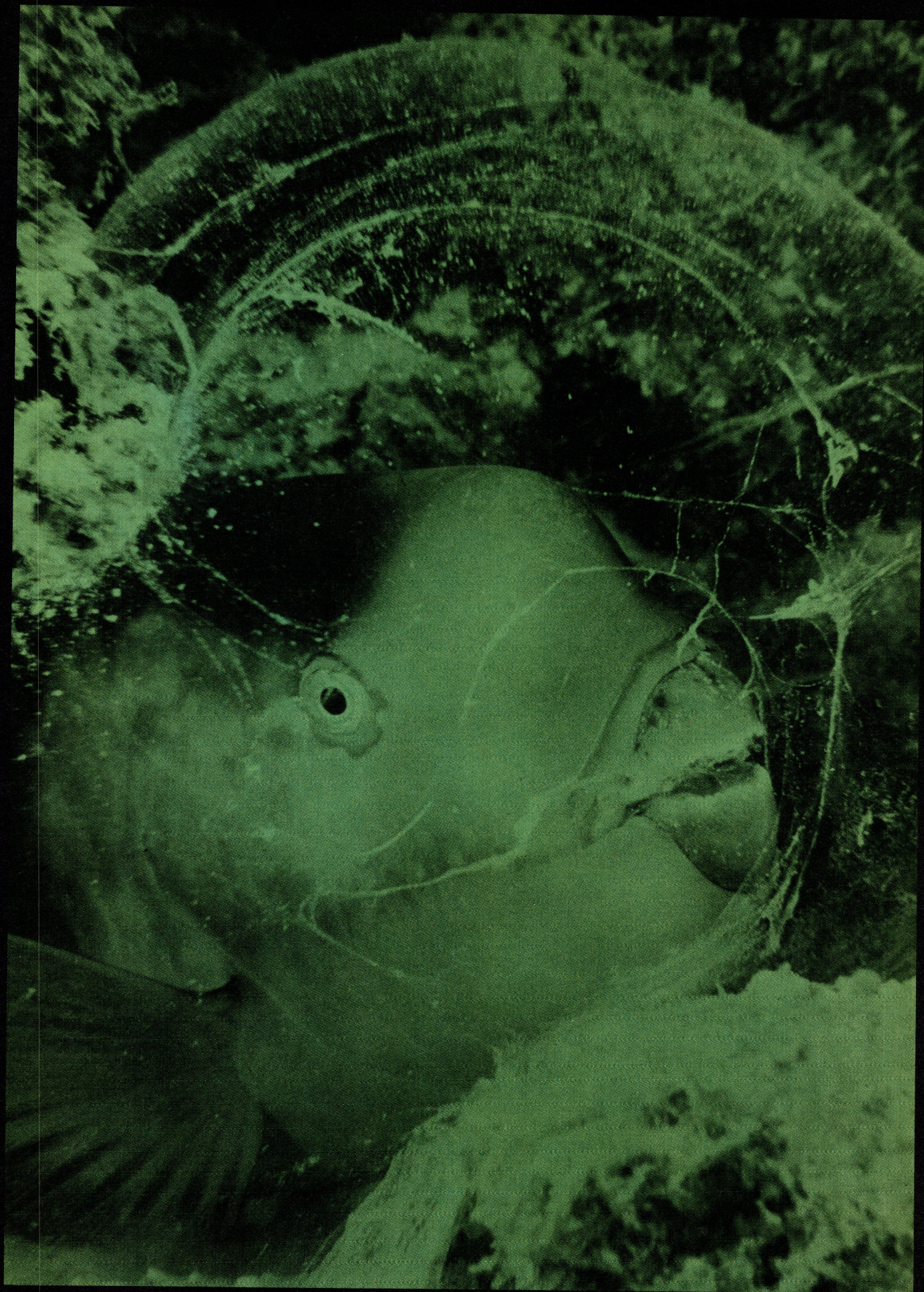
Under the Cloak of Night

By Doug Wallin

them at night. Also, during the day they are normally timid, seeking refuge when bothered but at night they swim around fearlessly, acting as though they own the place. They bristle out their fin spines, reminding one of a peacock proudly strutting about displaying its plumage.

A coral reef at night is a complex ecological community, no less so than during the day when sunlight has washed away the sleepy-eyed darkness. I have touched upon only a few of my observations of the sea's creatures — ones which have impressed me the most after years of diving in the dark. The sea at night is often frightening, usually mysterious, and always fascinating. >

photograph by Author

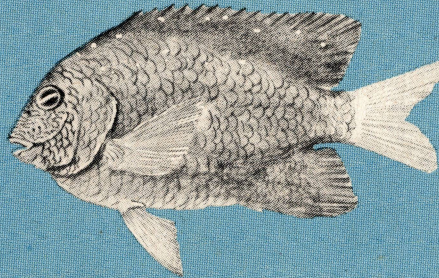


The Yellowtail Damselfish

(*Microspathodon chrysurus*)

A little fish with inlaid jewels — that's the yellowtail damselfish, a miniature gem of Caribbean reefs. A diver will know immediately when he sees one of these glittering little fishes, because there is no other damselfish in the entire west Atlantic that has such an array of spots. In fact, it is the bright, iridescent blue spots that have earned this fish the descriptive nickname "jewelfish."

□ The juvenile yellowtail damsel is one of the most outstanding fishes of Caribbean reefs. Their brilliant spots are accentuated by the overall body color of dark blue or bluish brown. Their tails can be dark, like the body, but are most often transparent and pale. As the fish grows, the tail abruptly becomes bright yellow, which is the obvious reason for the common name of the fish. The adults are not quite as sparkly as the juvenile, but because of their bright tails they are striking in their own right. Their overall body color is often brown, but can be reddish-brown, violet or even pale blue. The bright spots are less in number and somewhat smaller than those of the juvenile and are usually scattered around the head and dorsal area. The full grown yellowtail damsel is only about seven and a half inches long which, in spite of the relatively small size, makes it one of the larger damselfishes in the west Atlantic. □ Many divers know the



yellowtail damsel as it is one of the most common fishes in the West Indies. Bohlke and Chaplin have recorded it from Bermuda, the Bahamas, and Florida to the northern coast of South America, including the Gulf of Mexico. It is usually seen on shallow reefs at around 25 feet, but it has been known to occur to 68 fathoms. The fish always stays near the bottom, nibbling and pecking at algae which comprises the main part of its diet. In his studies, John Randall found that the yellowtail damsel also eats

sponge, gorgonian spicules and coral polyps as well as organic detritus. The juvenile has been observed picking parasites off other fish, which indicates that they do feed on parasites. □ The damselfishes comprise the Pomacentridae family, an interesting group of fish most noted for their courageous

little personalities, especially during the mating season. At this time the female lays her eggs in circular clusters on something solid, such as a rock, coral head or piling. The male then guards the eggs until they hatch, and he takes his job very seriously. He becomes extremely feisty and will attack big fish, or even a diver who dares to come too close to incubating eggs. This is only a frantic nipping procedure, but it is quite effective in scaring off predators many times his size. The courteous diver will back off from the subsea nursery.

Photo By Jack McKenney - Text By Hillary Hauser Anderson

Photo taken in 20 feet of water off Anthony's Key, Roatan, Honduras. McKenney used a Rolleimarin camera with a Honeywell strobe, Ektrachrome X, 1/125 sec., at f8, two feet from subject.



News Briefs

By Hillary Hauser Anderson



SEA-LINK REPORT

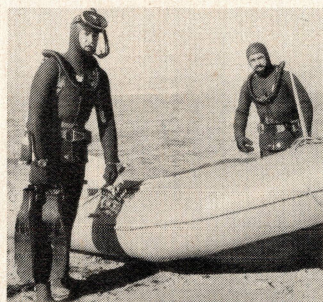
The final report on the Johnson-Sea-Link accident (SDM, Nov. '73) was expected to be submitted to Smithsonian Institution Secy. Dillon Ripley at the end of last November. As reported in Ocean Science News, the document was described as a "good, sound report, with no startling or dramatic conclusions." Recommended in the report was a diving operations officer (to be employed by the Smithsonian Ft. Pierce Bureau, someone with both Navy and small submersible experience) to direct all Sea-Link operations. Other recommendations in the report, according to OSN, were expected to deal with "elimination of exterior snags, gas readout and scrubbing equipment, and operating procedures."

AND THE MESS GETS MESSIER

The troubled Ancient Mediterranean Research Assn. is beset with further problems. (AMRA is the Pepperdine College group that made world headlines last summer when expedition leader Maxine Asher claimed that they had found the lost continent of Atlantis off Cadiz, Spain, (NB, Nov. '73, Jan. '74). Now, a Spanish judge has issued a warrant for Mrs. Asher because a check that was supposed to cover the group's expenses has been returned for lack of funds. Mrs. Asher, who is also being sued for \$1 million by a cinematographer who claims he lost \$45,000 in a proposed film documentary of the expedition, considers it all "one more effort to muddy the waters of Atlantis."

TUSKS AND SHRIMPS

What the narwhale uses its tusks for is apparently somewhat of a mystery. But two Canadian divers have observed narwhales using their tusks to burrow in the sea bed, stirring up shrimp (their favorite food). The divers, Wayne Gzowski and George Pieper, Arctic Divers Ltd., Yellowknife, N.W.T., observed the mammals during



a government sponsored exploration of the northern and eastern Baffin coast last year.

The two were surveying the area to see if it could support a viable fishing industry, and reported that the whole area was "teeming with shrimp." The Federal Fisheries department of Canada went into immediate action and has initiated an extensive research program on the possibility of fisheries, which may provide a big boost to the economic development of the entire Baffin region. As for the narwhales, Gzowski and Pieper report that they are "very gentle and beautiful to watch in the water," and plan to make underwater films on the mammal this year.

NET REVISE

We've heard from the Salt Water Aquarium Society of Hawaii (SWASH) that the restrictions on small-mesh nets for collecting marine tropicals (NB, Oct. '73) is no

longer in effect. SWASH spokesman Nancy Parker says that while the State Division of Fish and Game originally said they would not renew collecting permits, they had since reversed the decision and issued three month permits while they conducted studies on the problem. Hearings were held in September and the decision was made to issue collecting permits effective through the end of June, 1974. Collectors are required to submit a monthly report listing all fish and invertebrates captured and the details of capture, i.e., where, when and by what method.

SRS INFO

Many letters have come in expressing interest in the Sea Research Society College of Marine Arts in So. Carolina (NB, July '73). Persons seeking information about the college should write directly to College of Marine Arts, Sea Research Society, P.O. Drawer V, Sullivan's Island, So. Carolina 29482.

ARE DIVERS CHICKENS?

For what it's worth, a team of psychiatrists has reportedly found that Navy frogmen "choose their profession and brave the dangers of the deep sea because they are afraid of women." This little bit of information was offered up on the Hollywood Squares T.V. program across the nation and an anonymous reader wrote to tell us that all male scuba divers felt "put down before millions of T.V. listeners." We are checking this one out, so all of you men who tuned into this program, don't hang up your regulators, yet.

CAYMAN STUDY

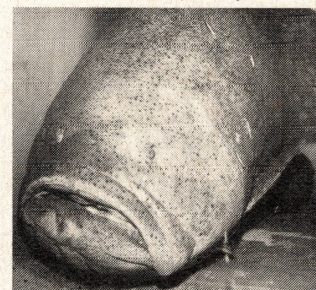
A two year marine life study has been approved by the Cayman Island legislature that will focus on the effects of dredging and sewage on reefs and marine life. The Marine Resources Survey, passed with a 10-4 vote, will also make recommendations for the controlled development of the islands so that minimum harm is done to the undersea environment. Underwater parks are a likely suggestion.

DIVER FINED

Last summer a Toronto diver was prosecuted for removing an antique anchor from the bottom of the Fathom Five Provincial Park near Tobermory, Canada (NB, June '73). The diver took the anchor near the site of a historical lumber camp on Cove Island, where early sail and steam vessels often anchored. The diver was fined \$20 and criminal charges were dropped.

JOSHUA THE GIANT

Last year Gerrit Klay caught a 500 pound jewfish off Marathon Key, Florida, which has since become the star of the show at the John G.



Shedd Aquarium in Chicago. The fish, dubbed Joshua the Giant Jewfish, is seven feet long and is reportedly the largest jewfish on exhibit in the country.

KNIVES OUT

California divers: Check your 1974 fish and game regulations regarding the taking of abalone. Chances are that you won't be able to use your diving knife to do the job. To help prevent injury to undersized abalone, the Calif. Fish and Game Commission recommended late last year that abalone be taken only by hand or with an abalone iron. The recommendation read: "The abalone iron is defined as a flat device not more than 36" in length and not less than 3/4" wide and not less than 1/16" thick; all edges of the device shall be rounded and smooth. Knives, screwdrivers and other sharp implements are prohibited." At time of

publication the proposed recommendation had not yet been made law, but passage was fairly certain.

PERRY BOOM

A Perry PC-8 submersible will be used by the Oceanography Dept. of Texas A&M to investigate natural oil seeps in the Gulf of Mexico. The \$150,000 vehicle was built by Perry especially for the university and features a 42 inch transparent acrylic nose for maximum visibility. The order is only a part of Perry's growing business. While many companies continue to await the ocean boom, Perry reported \$1 million in business during a good week last November.

BONES, NOISES, BUT NO NESSIE

After two months of prowling around Loch Ness, the Japanese team that is trying to find Nessie has given up—but only temporarily. Said one diver, "We are very disappointed, but we shall be back to try again," (most likely during spring of this year). The group reported hearing "weird noises," and for their efforts found only a pile of unidentifiable bones. The Japanese team first came to Loch Ness last fall (NB, Dec. '73) and has spent \$250,000 on their venture so far. The second phase of their search will involve the use of a specially built unmanned computer-operated capsule which is now being built in

Japan. The device will grope around Loch Ness, and send out electronic bleeps to locate the monster.

PRESIDENT'S AWARD

Skin and scuba diving has been added to the Presidential Sports Award Program. According to the New York State Divers Association *Diver's Digest*, Jim McMahan of the U/W Society of America pushed for the recognition by the President's Council on Physical Fitness and Sports. To qualify for the award, applicants must have dived (skin and scuba), or must have trained for diving a minimum of 50 hours. A fee of \$3 is charged. The award consists of an emblem, lapel pin and a certificate bearing the President's signature and seal. For other requirements and details, interested persons can pick up information and forms at any Montgomery Ward retail or catalogue store, or write Presidential Sports Award, Box 129, Radio City Station, N.Y., N.Y. 10019.

While scientists dive a mile and a half beneath the sea to find out what makes the earth tick, Stan Waterman will film it all.



OPERATION FAMOUS

For some time scientists have looked a mile and a half beneath the sea, to the Mid Atlantic Ridge, for information about the geologic history of the earth. Studies of the Ridge have yielded the "tectonic plate" theory, whereby great plates of the earth's crust undercut or overslide one another; this has explained continental drift, formation of the sea and mountains, earthquakes, volcanic activity, etc. However, all studies have been made from the surface and deductions have been theoretical.

Now, scientists are going to the ocean bottom to observe firsthand what's going on down there. The project, called Operation FAMOUS (Franco-American Mid-Ocean Undersea Study), is the joint effort of French and American scientists who will use deep submergence vehicles to explore the rift valley that runs along the Mid-Atlantic Ridge. The two countries will use the French bathyscaphe *Archimede* and submarine *SP 3000*, and the American

submersible *Alvin*. They will be used to map the Ridge and collect specimens along the rift.

Phase I of Operation FAMOUS began in 1973, with *Archimede* and *Alvin* making preliminary dives in various sections of the rift valley and along the Ridge mountains. Phase II of Operation FAMOUS will take place this year and scientists feel that exploration of the rift valley will yield important information about the geologic history of the earth and continental drift.

Stan Waterman, of Waterman Film Productions (*Blue Water — White Death*), has contracted to produce a half hour documentary film on Operation FAMOUS. Sponsors for the production are Woods Hole Oceanographic Institute, National Science Foundation, and NOAA. The key action is expected to take place this summer off the Azores. Waterman has already filmed the fitting of the new titanium sphere that has increased *Alvin's* depth range to 12,000 ft.

ODDS & ENDS . . .

Sea Habitat-San Francisco will be a million dollar marine life exhibit to be built on the San Francisco Embarcadero. . . . Stan Waterman (Waterman Film Enterprises) was recently appointed as a director of the Natl. Ocean Industries Assn. . . . In November a Navy diver was killed and another injured off San Diego when their submerged minisub was struck by a landing craft during amphibious exercises near North Island Naval Air Station. . . . Natl. Marine Fisheries Service will put trained observers aboard tuna seiners to gather data on the accidental kill of porpoises during the '74 fishing season. 25-28 observers will take data from 800-1200 seine nets to estimate porpoise mortalities.

Postal Gallery of Skin Diving Art



2



12

By M. W. Martin



5

A postage stamp featuring a skin diver has not been seen by many divers — and with good reason. Out of some 75,000 pictorial stamps issued around the world in the past 20 years, less than 30 depict divers in action.

The first stamp picturing a diver was issued by Russia in 1959 (1) as part of a set to honor the voluntary aids of the army. In 1968, Russia issued a striking stamp showing two scuba divers, one being towed by a motorized underwater vehicle. This stamp was part of a set to publicize youth sport competitions (2).

The sole United States entry in this postal gallery is a military issue — the 1966 commemorative of the founding of the U.S. Marine Corps Reserve. A frogman is included (3).

Promotion of tourism is an important stamp motif everywhere in the world, and the majority of skin diving stamps are from sets issued to publicize the pleasures awaiting the worldwide vacationer.

One of the earliest diving "tourist" issues, and the most unusual looking one, is a 1962 diamond shaped stamp of the Portuguese territory of St. Thomas and Principe Islands (4), two islands in the Gulf of

Guinea, 125 miles off the west coast of Africa. A close look at the stamp depicts the delights awaiting the skin diving tourist — a shark and a Portuguese man-o-war!

Other designs that clearly show the unfamiliarity of stamp designers with skin diving include a reef diving stamp of Fiji (5) showing the diver trying to catch a fish with his hands. Another depicts a scuba diver (on a 1971 stamp of Barbados) who is grasping coral with bare hands (6)!

Other tourism-promoting skin diving stamps include issues of the French territory of Afars and Issas (7), Gibraltar (8), Cayman Islands (9), Turks and Caicos (10) and Antigua (11). French Polynesia (12) has issued several diving stamps on various occasions and is the country with the most skin diving stamps.

Underwater fishing is the second most popular motif of skin diving stamps. French Polynesia issued a stamp in 1965 to commemorate the World Championships in Underwater Fishing at Tuamotu (13), and again in 1969 to publicize a similar event (14). The X-World Championship in Underwater Fishing is honored on a 1971 stamp of Chile (15). Pana-

ma (16), Nicaragua (17) and New Caledonia (18) are among the countries that have depicted underwater fishing on stamps. A 1962 stamp of Wallis and Futuna shows a diver collecting shells (19).

Two interesting one-of-a-kind issues are the 1962 stamp of Monaco intended to depict the old and the new (20), and a 1966 stamp of Finland showing a skin diver rescuing occupants of a submerged car (21). The Monaco stamp shows a diver with no equipment, and two modernly equipped counterparts.

Readers interested in forming a collection of skin diving stamps can spend many pleasant hours going through catalogs and browsing in stores.

Some 10,000 topical collectors — those collecting one subject — are banded in the American Topical Association, headquartered in Milwaukee. The A.T.A., with members in 90 countries, has local chapters throughout the United States. They issue a monthly magazine, handbooks, and hold shows where members may exhibit their collections for a trophy. Many lasting friendships can be formed through such a membership, for stamp collectors are a friendly group. >



21



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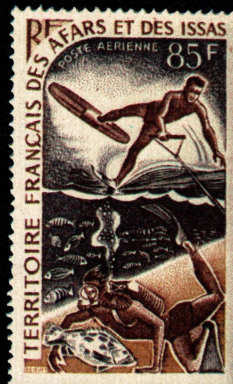
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1



9

photography by Jack McKenney

MAINE LOBSTERS

snatched from our grasp



By Thomas P. O'Connor

The States of Maine and New Hampshire are probably the only two places in the entire world where it is illegal to take lobsters while skin diving. In the State of Maine the lobster industry attempted to get a complete monopoly and almost succeeded. They were able to get a law passed which said that the traditional lobster trap is the only acceptable way of catching lobsters. This eliminated competition from scuba divers and draggers. The industry also pushed through a law making it illegal to lobster on Saturday and Sunday. This eliminated the part-time lobstermen who worked at other jobs during the week and fished on the weekend either commercially or for his own family. And a third law prohibiting the importing of out-of-state lobsters finally made the monopoly complete. However, this last law was thrown out by the Supreme Court which declared it to be in violation of federal statutes prohibiting monopolies.

I tried to set things straight by putting together a bill which would have made it legal for scuba divers to take lobsters for home consumption. I soon found out, however, that too often in the State of Maine might makes right and the reason that the lobster industry has been able to get such favorable legislation is that their great numbers are politically useful.

I had a great deal of trouble finding a sponsor for my bill. No one seemed to want to touch it with a ten foot pole. The divers in Maine are too small and inactive a group, politically speaking, and the lobstermen are just the opposite. After hearing arguments from about a dozen divers, a Portland representative said he would take the bill. While I was gathering support from as many diving clubs as I could contact, however, the representative turned

the bill over to Senator Bernard.

Senator Bernard told me immediately to forget any ideas I might have about righteousness or justice. It takes a large number of voters pushing for a bill to get it through the House and Senate. The only way he thought we would have a chance would be to fill the hearing hall with scuba divers and make sure that the committee knew that there were a lot of voters backing the bill. If we didn't, the lobstermen would fill the hall for sure and would get an "ought not to pass" vote from the committee. This would mean almost certain death for the bill. Also, Senator Bernard said it would mean the end of his support for the bill. He said he needed votes to stay in office and if the opposition at the hearing outnumbered the supporters for our bill he would withdraw his support. But he also said that he would do a lot of work behind the scenes in Augusta to help us with our bill.

Meanwhile I tried to muster support for our bill through letters to the State Senate and House of Representatives and phone calls to diving clubs throughout the state. The Maine Sub Aqua Club, which puts out a quarterly magazine for divers, distributed a special issue to alert the divers in Maine about our bill and to try to get them to circulate peti-

tions supporting our bill. Senator Bernard also got petitions circulated through his sources.

When the day of the hearing came Senator Bernard had petitions with about 3000 signatures. Nevertheless, the day of the hearing was a bad one for both the State of Maine and the scuba divers. Senator Bernard had told me that the hearing would be, in his words, "a farce." He suspected five members of the committee had already decided how to vote even before the hearing. "Timing" was against us also. The chairman had scheduled our bill for a day when a lot of lobster bills were being heard despite the fact that Senator Bernard had asked for a hearing on a separate day. Senator Bernard thought that many lobstermen would not object to our bill and wouldn't even come to Augusta to protest it. But as long as they were there anyway they would vote against it.

Senator Hofses opened up the hearing with an explanation that the hearing would consist of three parts. First the proponents of the bill would speak, then the opponents and lastly the proponents would have a chance for rebuttal. Then when the hearing opened up Senator Hofses, the chairman, said in plain English that his father had been a lobsterman and that he himself lived on the coast so he would naturally have to side with the lobstermen. The hearing had hardly begun when he made this statement.

This put the divers in a really angry mood. Some of them went forward fighting mad. The divers began with the philosophy that divers, as citizens, deserve a fair share in their state's natural resources and that the present law is depriving them of their civil rights. The present law discriminates against divers who are

a minority group in the State of Maine and reduces them to second class citizens. I myself tried to explain to the committee that the present law has created a great deal of hostility because it gives everything to the lobstermen and nothing at all to the divers.

When the opponents got up to speak they accused the divers of being a pack of thieves that would go out robbing traps if allowed to take lobsters. One lobsterman even went so far as to describe in detail the best locations and methods of robbing traps. Then a senator from a coastal town got up and said that for \$17 anyone could buy mask, fins and snorkel and go out taking lobsters, and that this would soon wipe lobsters out of existence. I suppose only a diver can understand how ludicrous this statement is in Maine.

Probably the biggest weapon that the lobstermen had was a federal biologist who had come to testify at an earlier hearing at which time he had come out in favor of letting draggers take lobsters off shore in deep water. However the biologist said that divers should not be allowed to take lobsters because the divers, while hunting for lobsters, would turn over rocks and these rocks would kill the young lobsters that live in tunnels that go as deep as eight feet into the mud. When one of the committeemen asked why the draggers wouldn't do the same thing, the biologist said that he thought the ocean floor below 200 feet was almost entirely mud and there were almost no rocks to kill the baby lobsters in those deep areas where the draggers operate.

When the proponents went back for rebuttal we tried to refute the charges as best we could and answer a few other questions. We didn't believe there would be any mad rush for those \$17 sets of diving gear: we did not have it in the past and we would not have it in the future. Lobster diving involves more gear than this, and lobster diving interest appeared to be limited to only a small segment of Maine's divers. I also explained that the committee I worked with came up with an estimate of about 3000 pounds of lobster for a projected annual catch. This, compared to the 26,000,000 pound annual catch by the commercial lobstermen, is very insignificant — less than one pound in 8000 would be taken by a diver.

The hearing came to a close right

after Commissioner Green got up and said that other states don't think as much of their lobster industry as we do in Maine. That seemed to be his main reason for not wanting the bill to pass. After the hearing Senator Bernard told me that the committee had all but completely ignored the petition with the 3000-plus signatures on it and he was very disappointed in them. He decided that, despite the fact that there was no possibility of an "ought to pass" vote by the committee, he was going

the bill in the hope that if he couldn't get lobster diving for the divers he could at least get something. This turned out to be a mistake. The lobster lobby and their friends in the House of Representatives pointed out that this amendment had not gone through committee hearing nor did it pertain to lobsters. Therefore they thought that the bill should be defeated because of improper procedure. The bill passed the Senate 19 to 7 for it, but was defeated in the House by a vote of



photograph by Paul J. Tzimoulis

to continue to fight for the bill on the legislative floor and he even thought it had a chance there. He said he could get Senate passage but that the divers would have to handle the House on their own.

Senator Bernard wrote an amendment to the bill when it came into the Senate for a vote which would have made it legal for scuba divers to take scallops year-round instead of just during the winter. Realizing the tremendous political pressures that he was facing, Senator Bernard decided to add this amendment to

approximately 120 to 10.

When I heard about the defeat I thought about the 200 letters that I myself had written, and of the work that all my friends had done in the belief that justice can triumph over political favoritism. Maine's scuba divers are a minority group too small to compete with the lobster industry or to hurt the state's ecology. But they still deserve a share in their state's natural resources. And the lobsters are one of the natural resources that belong to all Maine citizens, not just commercial interests.

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(Continued from Page 44)

August 17-24

NAUI Instructor Training Course, Chicago, Ill. (Contact: NAUI Central Branch, Box 14156, University Station, Minneapolis, Minn. 55414)

August 17-25

NAUI Instructor Training Course, Hempstead, N.Y. (Contact: NAUI Mid-Atlantic Branch, P.O. Drawer C, Deepwater, New Jersey 08023)

August 17 (5 weekends)

PADI Advanced Open Water Program. (Contact: Marty Bayerle, Brooklyn Divers, 2917 Ave. I, Brooklyn, N.Y. 11210)

August 19

Commercial Diving Class. (Contact: Divers Institute of Technology, Dept. S, Box 70312, Seattle, Wash. 98107)

August 24-31

NAUI Instructor Training Course, Stanford University, Calif. (Contact: NAUI Pacific Branch, 867 Basin St., San Pedro, Calif. 90732)

August 24-25

NAUI High Altitude/Fresh Water Workshop, Lake Tahoe, Nev. (Contact: NAUI Pacific Branch, 867 Basin St., San Pedro, Calif. 90732)

August 24-September 1

NAUI Instructor Training Course, Vancouver, B.C., Canada. (Contact: NAUI Canada, 10 Monet St., Etobicoke, Ont., Canada)

August 26-30

NAUI Basic Bio-Marine Exploration Seminar, San Diego, Calif. (Contact: NAUI Pacific Branch, 867 Basin St., San Pedro, Calif. 90732)

August 31-September 8

NAUI Instructor Training Course, Veracruz, Mexico. (Contact: NAUI Pacific Branch, 867 Basin St., San Pedro, California 90732)

September

NAUI Diving Instructors Vocational Education Seminar, Catalina Island, Calif. (Contact: NAUI Pacific Branch, 867 Basin St., San Pedro, Calif. 90732)

September 15-20

NASDS Clinic, San Diego. (Contact: NASDS Educational Division, 1214 Rosecrans, San Diego, Calif. 92106)

September 21

NAUI Diver Seminar. (Contact: NAUI Atlantic Branch, Box 291, Back Bay Annex, Boston, Mass. 02117)

September 21

NAUI Underwater Film Review, Boston, Mass. (Contact: NAUI North Atlantic Branch, Box 291, Back Bay Annex, Boston, Mass. 02117)

September 21 (6 weekends)

PADI Senior Advanced Course. (Contact: Marty Bayerle, Brooklyn Divers, 2917 Ave. I, Brooklyn, N.Y. 11210)

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September 23

Commercial Diving Class. (Contact: Divers Institute of Technology, Dept. S, Box 70312, Seattle, Wash. 98107)

September 30-December 6

NASDS College, San Diego. (Contact: NASDS Educational Division, 1214 Rosecrans, San Diego, Calif. 92106)

October 3

NAUI/NDA General Membership meeting, San Diego, Calif. (Contact: NAUI Hdqrs., 22809 Barton Rd., Colton (Grand Terrace), Calif. 92324)

October 4-6

NAUI 6th International Conference on Underwater Education, San Diego, Calif. (Contact: NAUI Hdqrs., 22809 Barton Rd., Colton (Grand Terrace), Calif.)

October 7

Professional Diving Instructor Course, Monterey, Calif. (Contact: Ed Brawley, 598 Foam St., Monterey, Calif. 93940)

October 12-13

YMCA Instructor Institute, Dallas, Texas. (Contact: D. Pat Ryan, 4332 Northaven Rd., Dallas, Texas 75229)

October 19

YMCA Instructor Institute, New York Metropolitan area. (Contact: Walt Hornberger, 7161 Spire Falls Rd., Ganesvoort, N.Y. 12831)

October 19

NAUI Underwater Symposium & Film Review, New York, N.Y. (Contact: NAUI North Atlantic Branch, Box 291, Back Bay Annex, Boston, Mass. 02117)

October 28

Commercial Diving Class. (Contact: Divers Institute of Technology, Dept. S, Box 70312, Seattle, Wash. 98107)

November

NAUI Underwater Symposium & Film Review, Philadelphia, Pa. (Contact: NAUI Mid-Atlantic Branch, P.O. Drawer C, Deepwater, N.J. 08023)

November 2-3

YMCA Instructor Institute, Dallas, Texas. (Contact: D. Pat Rayn, 4332 Northaven Rd., Dallas, Texas 75229)

November 16-18

NAUI Instructor Qualification Program, Montreal, Que., Canada. (Contact: NAUI Canada, 10 Monet Ave., Etobicoke, Ont., Canada)

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Commercial Diving Class. (Contact: Divers Institute of Technology, Dept. S, Box 70312, Seattle, Wash. 98107)

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NAUI Instructor Training Course, San Diego, Calif. (Contact: NAUI Pacific Branch, 867 Basin St., San Pedro, California 90732)

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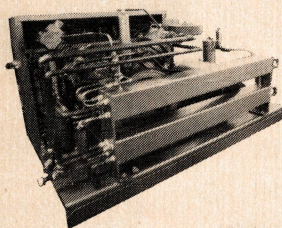
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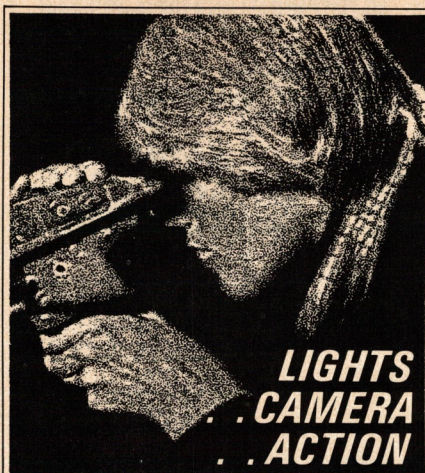
The National Association of Underwater Instructors has announced a totally new instructor certification program. After June 1, 1974, the old Instructor Certification Course (ICC) will be replaced with new programs designed to certify qualified candidates as NAUI instructors, NAUI assistant instructors, and NAUI skin diving leaders, and to provide them with the knowledge to effectively instruct several levels of diving.

One of the new programs is a 20 hour prerequisite Instructor Qualification Program (IQP) which gives successful candidates certification as a NAUI assistant instructor and qualifies them to attend the NAUI Instructor Training Course (ITC) for certification as a NAUI instructor. The qualification program is open to experienced divers 18 years and older, and places emphasis in evaluation areas of physical diving skills and written knowledge. It will be offered both as a two day program conducted independently, and as a 20 hour program immediately preceding an Instructor Training Course.

The 80 hour Instructor Training Course is primarily a learning experience for the candidate. How to teach and what to teach will be presented, discussed and shared by all in attendance. Course emphasis is on the practical aspects of diving instruction: classroom oral presentations; practical teaching presentations in open water; control of equipment, self and others in open water; and the use of integrated student training materials. This will all be supplemented by presentations on methods, skills and techniques to help candidates further develop their teaching abilities. Successful completion of the NAUI ITC qualifies candidates as members of the National Association of Underwater Instructors.

Divers 18 years of age and older may attend these programs. Successful completion of the ITC will result in certification as a NAUI skin diving leader for candidates under age 21. This authorizes them to independently teach sanctioned NAUI skin diving (not on scuba) courses. By remaining active in teaching and meeting leader renewal requirements each year, the leader will be certified as a NAUI instructor at age 21.

For complete schedule of NAUI events including the instructor programs, plus details of the new programs, write to NAUI Headquarters, 22809 Barton Road, Grand Terrace (Colton), Calif. 92324.



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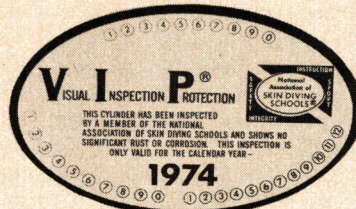
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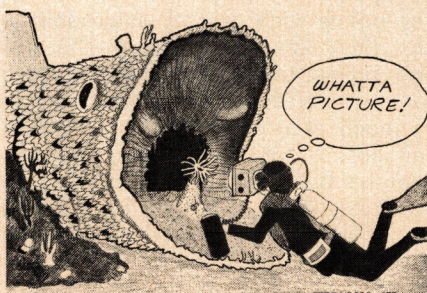
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BUMP

This month begins a series of unique field and study courses in the Boston University Marine Program (BUMP). From February through June 1974, intensive two-week courses and two semester-long courses will be given at the Marine Biological Lab at Woods Hole, Mass. The courses will include a fossil-hunting field expedition (April) and allow students to explore ocean areas off Cape Cod, Martha's Vineyard and Nantucket. Seminars will be conducted by scientists and grad students from Boston University, Woods Hole and National Marine Fisheries Service. For information, write Dr. Arthur G. Humes, Director BUMP, Marine Biological Lab, Woods Hole, Mass. 02534.

UNDERWATER SPECIALISTS

Dick Batchelder, owner of Underwater Specialists in Flint, Michigan, recently announced the opening of a second store of the same name in Ann Arbor. The new 1200 square foot facility has a full line of equipment for sale and service, a 5000 psi air system, and use of the recompression chamber located at the north campus of the University of Michigan, only four city blocks away. There is lots of parking around the new store at 1731 Plymouth Road, Ann Arbor, Michigan 48104.



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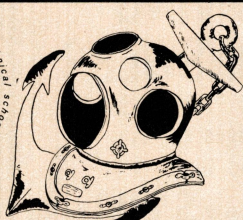
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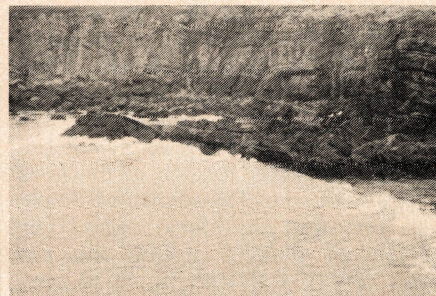
DIVER'S LOG

(Continued from Page 45)

faced with a rough exit, stop just outside the breaker zone, collect your thoughts, rest and resurvey the situation. Be sure all of your equipment is securely in place, particularly mask, snorkel and fins. Loss of any of these basic pieces of equipment would simply complicate matters. Don't drop your weight belt! You'll fare much better if you're able to control yourself in the water rather than like a cork on the surface. Of course, if you feel yourself on the verge of imminent danger, the weight belt, tanks and any other excess baggage should be unloaded immediately.



As you prepare to exit, keep an eye on the wave action. The periodicity of the waves will provide lulls during which a safer exit may be made. Don't fight the current. If a longshore current is running, move with it, and don't panic. Clear thinking is essential. Expose as little area as possible to the forces of the water. Do this by keeping your body as perpendicular to the surf line as possible, which will permit better control as you move toward shore.



Make your decision about the safest point to exit, mentally noting key points such as reef outcroppings, etc., then GO. Don't stop in the surf line unless unforeseen circumstances force a new decision. Protect yourself as much as possible — let your wet suit absorb some of the punishment. And be decisive. Once a position is obtained, keep it. Follow by securing that position and improving it until there remains no doubt as to the outcome — your safety.

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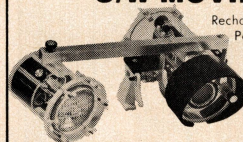
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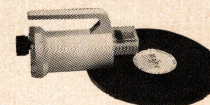
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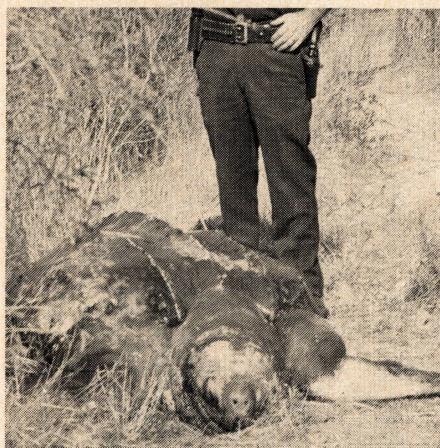
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TURTLE TROUBLE

BY J. D. CARMICHAEL

The policeman's query, "Did we have an unusually high tide last night?" started one of the most bizarre investigations of the Labor Day weekend by the Monterey, Calif. Police Department. The subject of the investigation was the carcass of a giant sea turtle.

It didn't take the police long to find out that four young skin divers had hauled the half-ton carcass up to a point near the city camp ground. According to witnesses, the divers said they were going to "gut" the turtle for its shell. This is the first report of a sea turtle in Monterey Bay in about 15 years.



The city officials of Monterey are very upset about the turtle incident. To have a half ton of decaying flesh dumped on them in the middle of a holiday weekend isn't their idea of a joke. There have been other diving-related incidents around the Monterey Peninsula over the years. Many have been favorable: divers have voluntarily taken it upon themselves to try to clean things up, cleaning the bottom as well as the top of the bay. Unfortunately, the good things people do are often not remembered, while the bad ones loom like skyscrapers to haunt them. This seems to be the case at present.

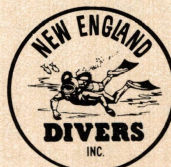
There doesn't seem to be any particular action planned by the City of Monterey at this time to curtail skin diving. This doesn't mean they've forgotten about the turtle. Other incidents, which will undoubtedly occur in the future, will keep it fresh in their minds. Such thoughtless action by a few can well jeopardize skin diving all along the coast. Where we were once welcomed, we may well find ourselves unwelcome. It can come in so many ways. This is our problem: if we want to continue to have good access spots for diving we are going to have to do something about it. >>>



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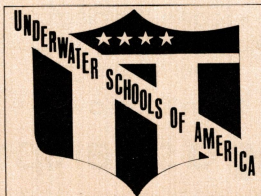
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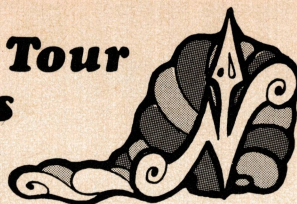
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Dive Tour News



- Feb. 1—PANAMA/GUATEMALA—12 days, Photomarine Int'l Travel, Reseda, Calif.
- Feb. 1, 8, 15, 22—BONAIRE—8 days, Royal Caribbean Services, New York, N.Y.
- Feb. 2—BIMINI—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
- Feb. 8—COZUMEL/AKUMAL—8 days, Sunland Int'l Tours, Beverly Hills, Calif.
- Feb. 8—ICE DIVE—3 days, Skin Diving School, Bronx, N.Y.
- Feb. 11—HAWAII/KONA—8 days, Photomarine Int'l Travel, Reseda, Calif.
- Feb. 12—BIMINI—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
- Feb. 15—COZUMEL/YUCATAN—7-12 days, See & Sea, San Francisco, California
- Feb. 16—CAYMAN ISLANDS—8 days, See & Sea, Inc., San Francisco, California.
- Feb. 17—BONAIRE/CURACAO—10 days, Carl Roessler, See & Sea, San Francisco, Calif.
- Feb. 17—COZUMEL—7 days, Go Mexico, Inc., Minneapolis, Minn.
- Feb. 18—ROATAN/HONDURAS—8 days, Island Reef Safaris, Wilton, Conn.
- Feb. 22—BAHAMAS—3 days, Grand Am Int'l Tours, Ocala, Fla.
- Mar. 1, 8, 15, 22, 29—BONAIRE—8 days, Royal Caribbean Services, New York, N.Y.
- Mar. 2—BIMINI—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
- Mar. 2—BERMUDA—7 days, Skin Diving School, Bronx, N.Y.
- Mar. 8—COZUMEL/AKUMAL—8 days, Sunland Int'l Tours, Beverly Hills, Calif.
- Mar. 12—NASSAU—10 days, Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
- Mar. 15—COZUMEL/YUCATAN—7-12 days, See & Sea, Inc., San Francisco, California.
- Mar. 15—AFRICA/INDIAN OCEAN—21 days, Carl Roessler, See & Sea, San Francisco, Ca.
- Mar. 15—SPANISH HONDURAS—4 days, Grand Am Int'l Tours, Ocala, Fla.
- Mar. 16—CAYMAN ISLANDS—8 days, See & Sea, Inc., San Francisco, California.
- Mar. 24—COZUMEL—7 days, Go Mexico, Inc., Minneapolis, Minn.
- Mar. 25—PANAMA/SAN BLAS—10 days, Photomarine Int'l Travel, Reseda, Calif.
- Mar. 26—NASSAU—7 days, Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
- Mar. 29—BAHAMAS—3 days, Grand Am Int'l Tours, Ocala, Fla.
- Apr. 2—TRUK/PONAPE—11 days, Innerspace Adventures, Hickam, Hawaii
- Apr. 5—COZUMEL/AKUMAL—8 days, Sunland Int'l Tours, Beverly Hills, Calif.
- Apr. 5—NASSAU—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
- Apr. 5, 12—BONAIRE—8 days, Royal Caribbean Services, New York, N.Y.
- Apr. 7—SPANISH HONDURAS—6 days, Grand Am Int'l Tours, Ocala, Fla.
- Apr. 9—CARTAGENA, COLOMBIA—11 days, Sunland Int'l Tours, Beverly Hills, Calif.
- Apr. 10—ROATAN/HONDURAS—6 days, Island Reef Safaris, Wilton, Conn.
- Apr. 15—HAWAII/KONA—8 days, Photomarine Int'l Travel, Reseda, Calif.
- Apr. 19—TAHITI/RANGIROA—9 days, Photomarine Int'l Travel, Reseda, Calif.
- Apr. 19—COZUMEL/YUCATAN—7-12 days, See & Sea, Inc., San Francisco, California.
- Apr. 20—TRUK/PALAU—15 days, Atlantis Safaris, Miami Shores, Fla.
- Apr. 20—SP. WELLS, BAHAMAS—7 days, Skin Diving School, Bronx, N.Y.

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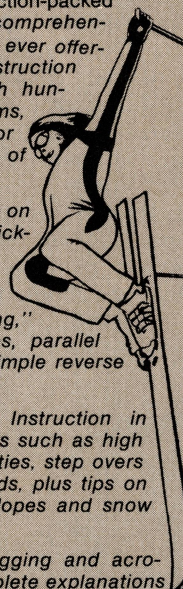
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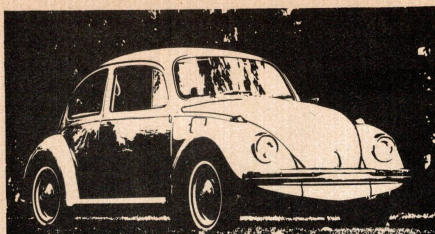
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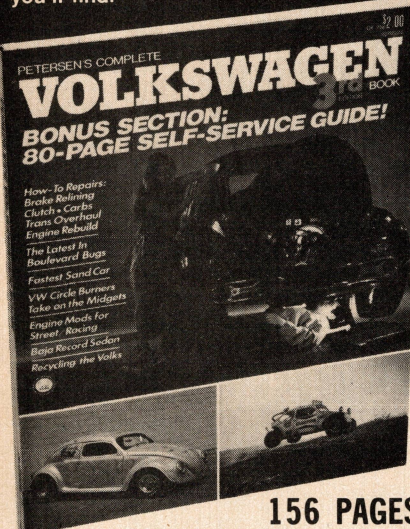
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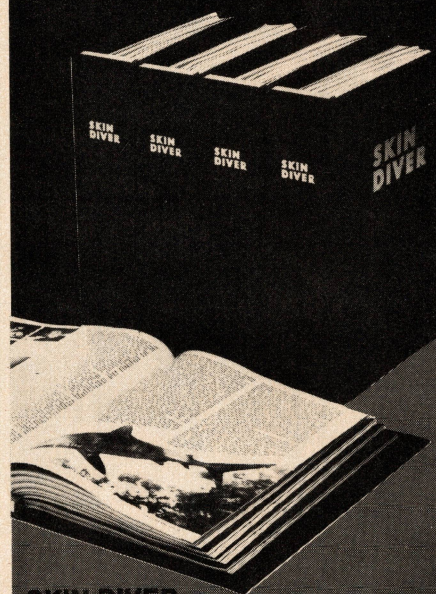
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- Apr. 20 & 30 — **FREEPORT**—7 days, Adventure Cruises, Ft. Lauderdale, Fla.
Apr. 21 — **COZUMEL** — 7 days, Go Mexico, Inc., Minneapolis, Minn.
Apr. 21—**BONAIRE/CURACAO** — 10 days, Dewey Bergman, See & Sea, San Francisco, Ca.
Apr. 26—**BAHAMAS**—3 days, Grand Am Int'l Tours, Ocala, Fla.
Apr. 27 — **TRUK/PALAU** — 15 days, Atlantis Safaris, Miami Shores, Fla.
May 11—**NASSAU**—7 days, Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
May 12—**GRAND CAYMAN**—9 days, Photomarine Int'l Travel, Reseda, Calif.
May 17—**COZUMEL/YUCATAN** — 7-12 days, See & Sea, Inc., San Francisco, California.
May 17—**SPANISH HONDURAS**—4 days, Grand Am Int'l Tours, Ocala, Fla.
May 18 — **GREEK ISLANDS** — 17 days, Emery Travel Service, Bradford, Pa.
May 18—**GRAND CAYMAN**—7 days, Skin Diving School, Bronx, N.Y.
May 19—**BONAIRE/CURACAO** — 10 days, Rick Tegeler, See & Sea, San Francisco, Calif.
May 19 — **COZUMEL** — 7 days, Go Mexico, Inc., Minneapolis, Minn.
May 20—**BIMINI**—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
May 24—**COZUMEL/AKUMAL**—8 days, Sunland Int'l Tours, Beverly Hills, Calif.
May 24 — **COZUMEL/CHINCHORRO REEF** — 11 days, Sunland Int'l Tours, Beverly Hills, Ca.
May 25—**CAYMAN ISLANDS** — 8 days, See & Sea, Inc., San Francisco, California.
June 8—**SPANISH HONDURAS**—6 days, Grand Am Int'l Tours, Ocala, Fla.
June 8—**BIMINI**—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
June 11—**HAWAII/KONA**—8 days, Photomarine Int'l Travel, Reseda, Calif.
June 11 & 25—**TRUK/PONAPE**—11 days, Inner-space Adventures, Hickam, Hawaii.
June 14—**RIO DE JANEIRO, BRAZIL**—14 days, Sunland Int'l Tours, Beverly Hills, Calif.
June 14—**COZUMEL/YUCATAN** — 7-12 days, See & Sea, San Francisco, California.
June 15 — **TRUK/PALAU** — 15 days, Atlantis Safaris, Miami Shores, Fla.
June 17 — **AKUMAL** — 10 days, Photomarine Int'l Travel, Reseda, Calif.
June 19—**BIMINI**—10 days, Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
June 22—**CAYMAN ISLANDS** — 8 days, Dewey Bergman, See & Sea, San Francisco, Ca.
June 22 — **COZUMEL** — 7 days, Skin Diving School, Bronx, N.Y.
June 23 — **COZUMEL** — 7 days, Go Mexico, Inc., Minneapolis, Minn.
June 24—**PANAMA/SAN BLAS**—10 days, Photomarine Int'l Travel, Reseda, Calif.
June 26—**GALAPAGOS ISLANDS** — 18 days, Dewey Bergman, See & Sea, San Francisco, Ca.
June 28 — **COZUMEL/AKUMAL** — 8 days, Sunland Int'l Tours, Beverly Hills, Calif.
July 3 & 15—**NASSAU**—7 days, Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
July 12—**SPANISH HONDURAS**—4 days, Grand Am Int'l Tours, Ocala, Fla.
July 13—**ANDROS, BAHAMAS**—7 days, Underwater Safaris, Boston, Mass.
July 20 — **BRITISH HONDURAS** — 8 days, Sunland Int'l Tours, Beverly Hills, Calif.
July 21 — **COZUMEL** — 7 days, Go Mexico, Inc., Minneapolis, Minn.

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 July 28—TAHITI/RANGIROA—9 days, Photomarine Int'l Travel, Reseda, Calif.
 Aug. 2—BIMINI—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
 Aug. 2, 30—COZUMEL/AKUMAL—8 days, Sunland Int'l Tours, Beverly Hills, Calif.
 Aug. 10—SPANISH HONDURAS—6 days, Grand Am Int'l Tours, Ocala, Fla.
 Aug. 12—BIMINI—10 days, Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
 Aug. 19—PANAMA/SAN BLAS—10 days, Photomarine Int'l Travel, Reseda, Calif.
 Aug. 20—TRUK/PONAPE—11 days, Innerspace Adventures, Hickam, Hawaii.
 Aug. 26—NASSAU—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
 Aug. 30—COZUMEL/CHINCHORRO REEF—11 days, Sunland Int'l Tours, Beverly Hills, Calif.
 Sept. 2—MARISLA/SEA OF CORTEZ—7 days, Photomarine Int'l Travel, Reseda, Calif.
 Sept. 6—NASSAU—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
 Sept. 13—SPANISH HONDURAS—4 days, Grand Am Int'l Tours, Ocala, Fla.
 Sept. 13—RIO DE JANEIRO, BRAZIL—14 days, Sunland Int'l Tours, Beverly Hills, Calif.
 Sept. 27—BIMINI—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
 Oct. 4—MARISLA/SEA OF CORTEZ—7 days, Photomarine Int'l Travel, Reseda, Calif.
 Oct. 7—BIMINI—7 days, Capt. Skeet LaChance, Adventure Cruises, Ft. Lauderdale, Fla.
 Oct. 11—COZUMEL/AKUMAL—8 days, Sunland Int'l Tours, Beverly Hills, Calif.
 Oct. 12—SPANISH HONDURAS—6 days, Grand Am Int'l Tours, Ocala, Fla.
 Oct. 22—TRUK/PONAPE—11 days, Innerspace Adventures, Hickam, Hawaii.
 Oct. 27—TAHITI/RANGIROA—9 days, Photomarine Int'l Travel, Reseda, Calif.
 Nov. 10—SPANISH HONDURAS—4 days, Grand Am Int'l Tours, Ocala, Fla.
 Nov. 22—COZUMEL/AKUMAL—8 days, Sunland Int'l Tours, Beverly Hills, Calif.
 Nov. 27—HAWAII/KONA—8 days, Photomarine Int'l Travel, Reseda, Calif.

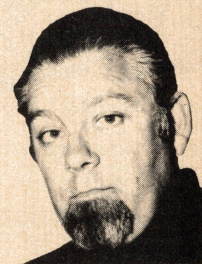


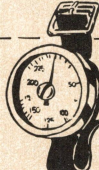
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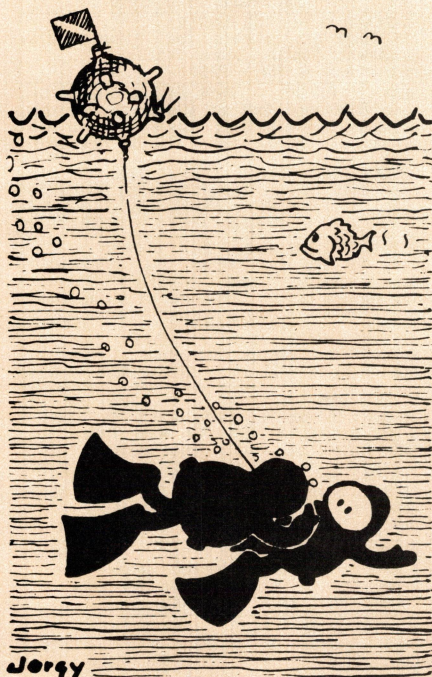
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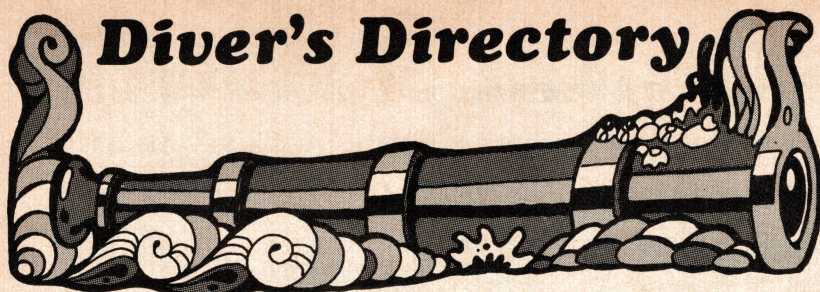
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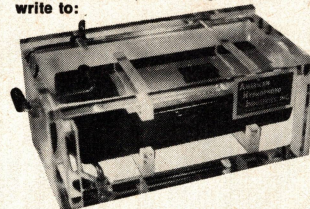
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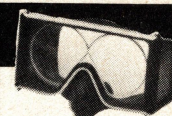
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Certain areas of the world are possessed of a special aura, a fascination that evokes response from deep within even the most hardened travelers. The Galapagos Islands are one of these mystic destinations, shrouded in a multi-million year history they share with no other spot on our planet.

Lying on the equator, the Galapagos have received life-bearing debris over countless ages from Antarctica and the western coast of South America, from the California to Panama coast, and from the far reaches of the South Pacific. Acting as a biological hothouse, the islands nurtured these refugees from far-off ocean realms. The "shipwrecked" species in their turn adapted to the climate, soil and food of the islands in such a way that now, eons later, the survivors have evolved to be quite different from their forebears.

All of this became relevant to the outside world when a young English biologist named Charles Darwin perceived the entire history of evolution from his extrapolation of information and observations gathered during his visit to the Galapagos aboard the research ship *Beagle* in 1835. Ever since, the islands have been legendary for the uniqueness, tameness, and observability of their biological wonders — the pot of gold at the end of the traveler's rainbow.

Every superlative ever written about the Galapagos is true. There is no way to prepare for the profusion, mystery and wonders of the islands. In retrospect, all I can say is that it was a rare privilege indeed to lead Sea & See Travel's inaugural diving adventure to the Galapagos. An enormous amount of planning was necessary before a first-class, unlimited-diving program could be offered, but the adventures we had were worth it.

Once again, as in our spectacular Australia/Coral Sea programs, Pan American Airways offered invaluable aid to us. First they got our divers and equipment to Ecuador, the threshold of the Galapagos. And then, from the moment we set foot on the fabled islands the wonders came at us in a constant stream, almost too rich to properly digest as they happened.

Our diving cruiser was the magnificent *Golden Cachalot*. The *Cachalot* sleeps 12 guests comfortably, and normally acts as a cruiser for groups of photographers, scientists and tourists observing the marvels of the islands. Originally built in 1889, the *Cachalot* is a beamy, 93 foot long three masted schooner which was completely rebuilt in 1968 for Galapagos service. Led by Captain Richard Foster, the crew of nine is experienced and able. A particular asset is the on-based naturalist, Soames Summerhays.

Both Soames and Richard are avid divers, as well as deeply versed in the broad range of Galapagos fauna. They made special surveys of the islands to research the best diving before our group arrived, and the itinerary they offered was obviously well chosen. For example, they took us



By Carl Roessler

photography by Author





The prehistoric-looking marine iguana, above, munching on shallow water algae has become symbolic of the unusual life found in the Galapagos. The strangeness of the creatures found around Darwin's enchanted islands still mystify us, as hundreds of species have yet to be identified. The tiny fish, below, the author dubbed Cyrano, is a longsnouted hawkfish. The bright red starfish was only seen at night by the divers who enjoyed land exploration as well with its array of unusual creatures including the colorful Sally light-foot crabs scampering around.



to the foreboding black lava pinnacles known as Gordon Rocks. From a distance we could see heavy surge lashing the sheer rock faces, and sea lions perched on precarious ledges just out of the waves' reach.

The divers suited up, and the *Golden Cachalot* made a sweeping pass close by the rocks. Entering the water together, our party of divers swam on the surface until we saw the precipitous cliff face extending downward into the cold, fairly clear water. The great lava face was pockmarked with countless holes apparently burrowed by pencil-spined urchins seeking shelter. The entire wall was covered with life, especially as we moved deeper.

Brilliantly colored encrusting sponges in reds and golds, enormous starfish, thickets of gorgonian and a bright yellow bush which we later identified as black coral festooned these great pinnacles from the deep. Then came a fantastic sight. A great school of amberjack appeared all about us, circling us for several minutes and passing so close we could practically touch them. We made two dives with the amberjacks, moving on a swift current through a narrow pass to a shallower area filled with white-striped angelfish, curious sea lions, and practically tame snappers.

Another unique dive site is the northeastern point of Fernandina Island, known as Punta Espinosa. The water between Fernandina and Isabella islands was the coldest of the trip, around 60 degrees. There, amid great squared-off boulders, were undersea riches to boggle the diver's mind: great scallops six to nine inches across the shell with unbelievably colored mantles of red and gold and blue; albino stingrays nestling on the sand between the rocks; almost-tame sheepsheads in remarkable patterns of orange, white and black; and enormous scorpionfish with complicated tassels on their chins.

In deeper water offshore we came upon an unusual, small fish perched on an orange gorgonian. This colorful specimen was garbed in red and white checks, with a long pointed snout. After I had taken one picture of it I noticed that my plexiglass strobe housing had salt water in it. Knowing the effects of salt water on electronic equipment I muttered audible prayers for the blankety-blank thing to give me one more shot. My wife Mary tells me it was like watching the raving Richard III offer "My Kingdom for a horse!"

In the middle of this scene 90 feet down a curious penguin swooped by, obviously drawn to this outrageous confusion. When we followed the penguin we ran into a large albino stingray. Every dive was like that, the unexpected piling upon the unexpected . . .

At Gardiner Island, in the southern Galapagos, is another barren pinnacle rising from the sea floor. This time our divers used the *Cachalot's* launches to go right to the base of the sheer cliffs. Slipping into the water in a small cove, we were confronted with a wall of varied color and life. Huge golden black coral trees shaded swarms of damselfish, juvenile angelfish, blennies and other smaller fish; in the open water amberjack, sheepshead and great waves of roan-colored creolefish filled the entire visible area.

As we soared down into deeper water the rock sloped outward and we passed through a distinct and chilling thermocline. At 150 feet a strong current plucked at us, and we had to move hand over hand from rock to rock. But somehow we had stumbled into an immense garden of color and texture. Orange sponges poked up from

the drab grey boulders like dead men's fingers, clusters of bright pink hydrocorals were big as fists, and the gorgonians practically formed a surging carpet.

At Champion Island we were greeted with a new sight — large coral heads reminiscent of the Caribbean, with clouds of small fish nearly blotting out the light. Here we found several good-sized curious groupers who seemed not to mind our presence in the least, a huge green turtle swimming placidly by, and an unusual yellow butterflyfish which flared its dorsal spines and lowered its head at us as if to threaten us with goring. In later conflicts with members of its own species, we knew this "baby bull" would actually charge with his horns in highly ritualized battle.

We made two night dives in those dark and remote islands, both of which were as spectacular as any we could have imagined. Blood-red spiny starfish, not seen during any of our daylight dives, emerged for feeding. Huge scorpionfish lay motionless on the algae-covered lava, their malevolent flat eyes gleaming in the glare of our lights. A brilliant golden sea horse performed for our cameras, and creolefish clad in their very different sleeping colors curled their bodies around brilliant yellow-and-rose puffballs of night-blooming coral. Large slipper lobsters hitched their way haltingly across the uneven rocky bottom, their distinctive purple antennae quivering in uncertainty.

I should mention our constant companions, the sea lions. There are two species in the Galapagos. One, an endemic subspecies of the California sea lion, is found far and wide throughout the archipelago. The second species, distinctive for its large, glossy eyes and external ears, is the Galapagos fur sea lion, found only at James Bay. The fur sea lions were curious but timid, while the other sea lions were a source of unending merriment.

Their boundless curiosity made the sea lions constantly wheel and flash past us, rolling their eyes and blowing bubble bursts as if to imitate ours. In one sense they were something of a threat to our cameras. We often looked over at one another to see sea lions trying to nip at the other divers' cameras, strobe lights and electrical cords. But somehow we never minded — it all seemed in a continuous spirit of fun. After a while we even missed the frisky sea lions at those few dive spots where they didn't show up.

Other endemic Galapagos species deserve special mention. On two islands, Hood and Fernandina, live isolated separate species of marine iguanas. The Fernandina marine iguanas were one of our special photo subjects, and we arrived early one morning eager to get into the water with these primitive creatures. We found the water still as glass as we anchored after having hurriedly bolted our usual generous breakfast.

Readying all our photo gear, we moved slowly and quietly in the small boats toward the black rounded lava rocks. As we neared the rocks, in 10 to 15 feet of water, we could see hundreds of the iguanas sunning on the dull stone. Slipping quietly into the water in full diving gear and carrying large photo rigs is no joke, but the stakes were high.

For a maddening hour we searched through the entire area for even a single feeding iguana, and found none. Every time we surfaced empty-handed, we could see the lizards stolidly enjoying the sun, perched all over the point. We were ready to give up when, as if by signal,

iguanas began to lurch down the rocks and swim out to feed. In our eagerness we had beaten low tide, their inflexible feeding time.

For the next two hours we photographed iguanas, swam with, enjoyed, and marveled at those incredible echoes of earth's distant past. Folding their legs against their bodies they swam with slow sweeps of their sinuous bodies and long slender tails, with their heads and backs above water. When they wanted to feed, they would swim down to an algae-covered boulder and, like a bird coming in for a landing, extend their legs and claws and spread-eagle amid the succulent green plants.

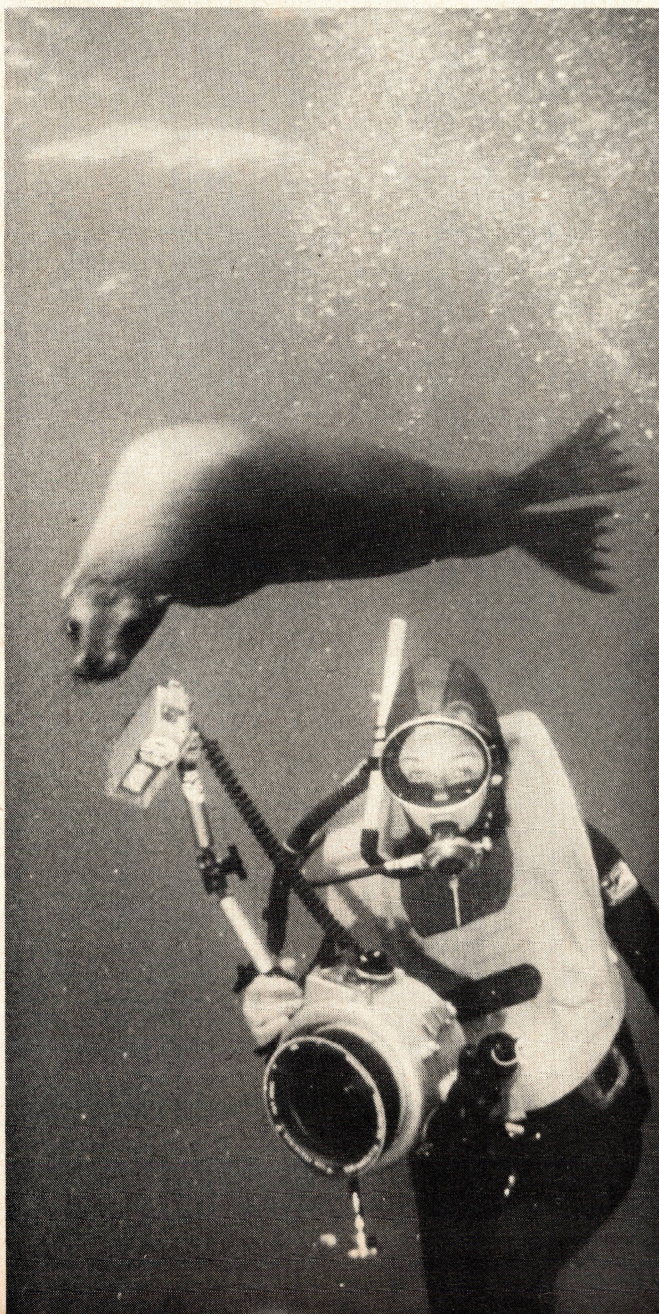
Their long claws gave the lizards excellent purchase, even in the surging shallows. Attached to a rock, they would pull the algae free with a jerk of their head and placidly munch, oblivious to divers or any other disturbance — even from the pesky sea lions which loved so much to devil them.

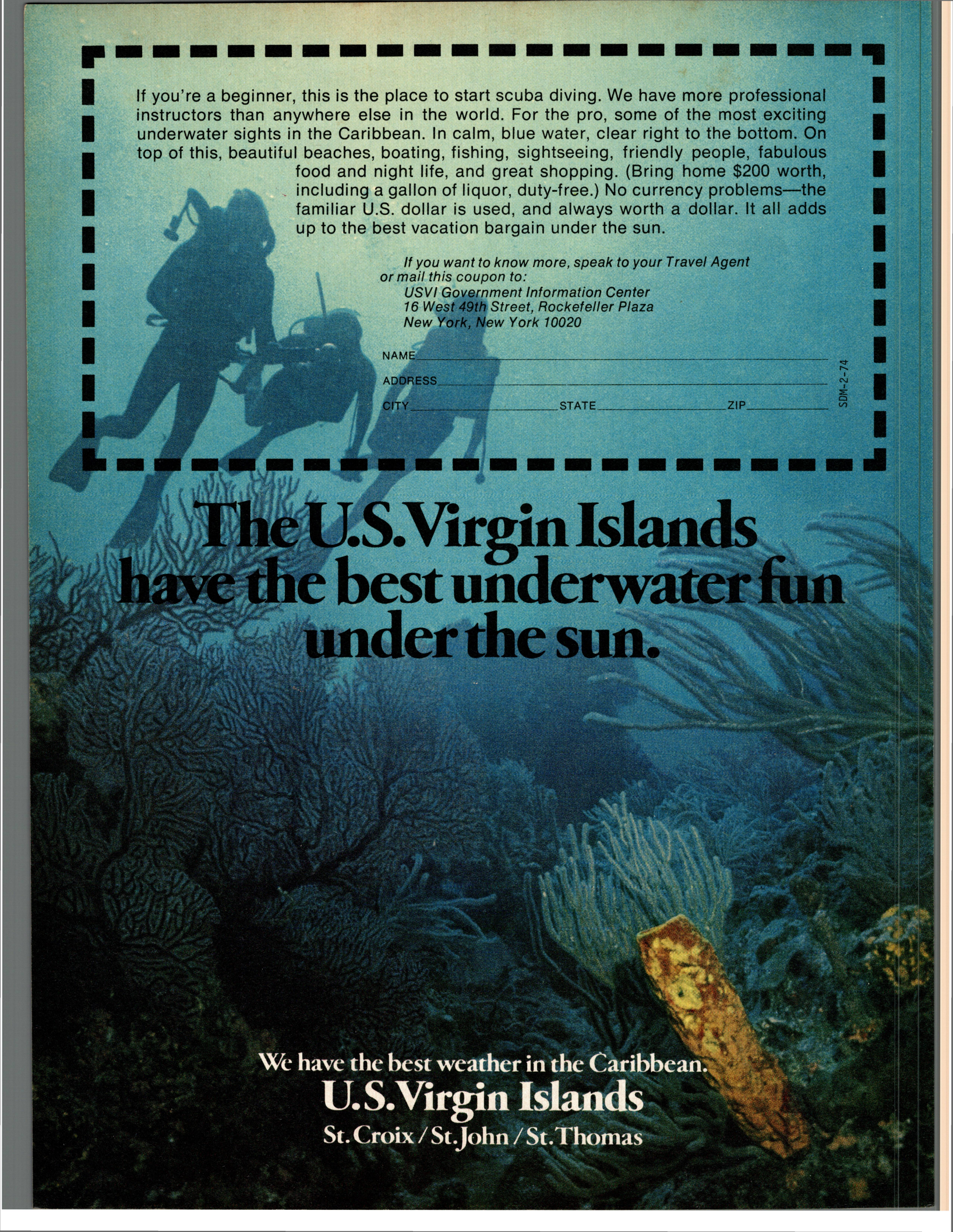
There were so many dives, each so different, that merely to describe them all in the briefest way would

take far too much space. Octopuses, moray eels, giant damselfish, wrasse, and many species I couldn't even identify, filled our dives with moment-to-moment thrills. And while I was struggling to digest and make decipherable notes on the unusual sightings incurred in each of three or four daily dives, I was simultaneously grabbing my land camera and running for the *Cachalot's* launches in order not to miss the between-dives shore excursions.

We're really looking forward to another Sea & See diving adventure to the Galapagos next summer. Perhaps we'll see that man-sized porcupinefish again, and this time get close enough for a picture. Perhaps this time we'll get those giant ocean sunfish we missed, or get into the water ahead of the whales off Punta Vicente Roca. Perhaps we'll find the golden sea horse again, and those brilliant deep-water anemone, and the night blooming coral in bright yellow and rose. Perhaps the sea lions will nibble on our cameras again and toss the marine iguanas in the air for sport. For that's the way each day goes in Darwin's islands. >>>

Sea lions constantly danced around the divers zooming in to nip at equipment, but were missed when they didn't show up. Below Mary encounters a grazing iguana.





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For further information contact: Bert and Jacki Kilbride, Saba Rock, British Virgin Islands. >

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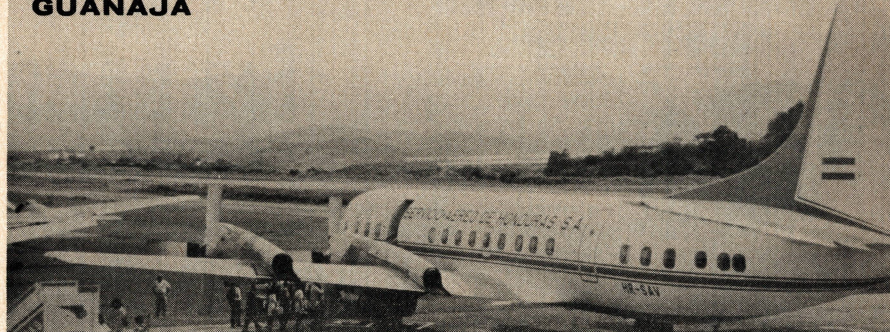
Bob Soto has opened a new facility in the British West Indies — Bob Soto's Dive Shop at Holiday Inn Hotel. Located on Grand Cayman's famous seven mile beach, the shop is adjacent to crystal clear waters and surrounded by some of the world's most fascinating diving areas. The shop is staffed by professionals offering nearly everything for the diver: all leading lines of diving equipment are available for sale or rent.



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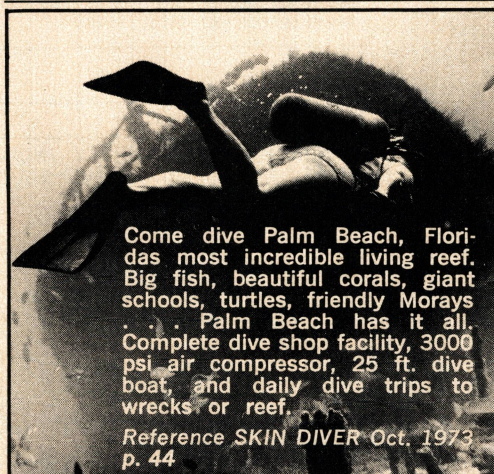
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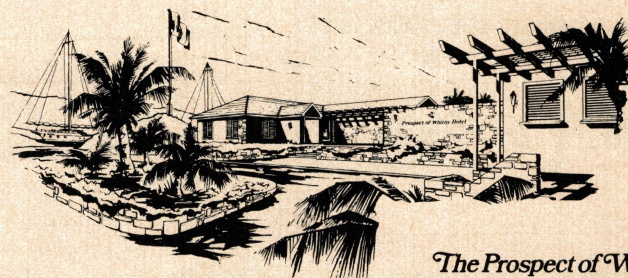
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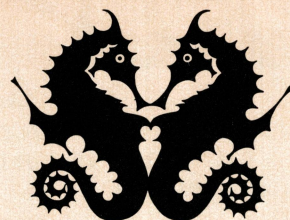
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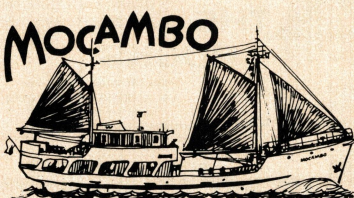


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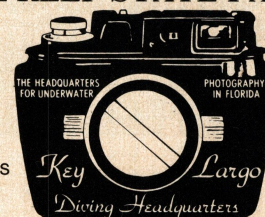
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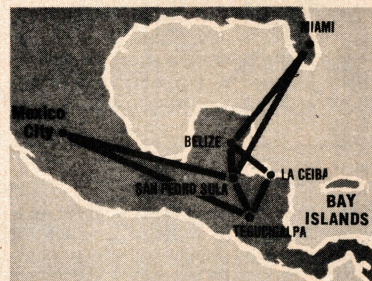
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Vacationers have a choice of four hotels: Shibui, Beachcomber, Contant Great House and Tropic Isle. Tour prices, including twin accommodations, range on the European plan from \$342.50 per person to \$227, depending on the hotel. Under the Modified American Plan, the price is from \$412.50 to \$297 each. Air fare is additional in each case. Further information about the St. Thomas — Diving Days tour can be obtained from your local travel agent or by contacting the Tour Director, American Airlines, 633 Third Ave., New York, N.Y. 10017. ➤

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Spanish Bay Reef Resort, on Grand Cayman Island in the Caribbean, is hosting a series of six day seminars for new and intermediate underwater photographers. Based on the Ron Church School of Underwater Photography course, the curriculum gives special attention to tropical marine biology and how to capture its most interesting aspects on film. Instructor for the course will be Nancy Sefton, who, with her husband Ron, owns Spanish Bay Reef.



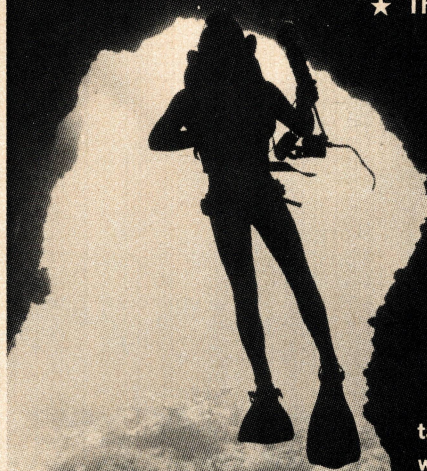
Course dates are April 21-28; May 5-12; May 19-26; Sept. 22-29; Oct. 6-13; and Oct. 20-27. The cost of the course is \$300, which includes hotel accommodations for six days, seven nights; three meals daily; two dives daily; govt. tax and gratuities; and all scheduled ground transportation. Send a \$100 deposit (per student) no later than 30 days in advance to: Spanish Bay Reef, Box 800, Grand Cayman, B.W.I. ➤

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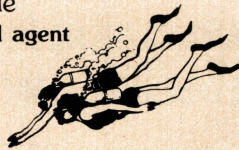
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25 full day — year round

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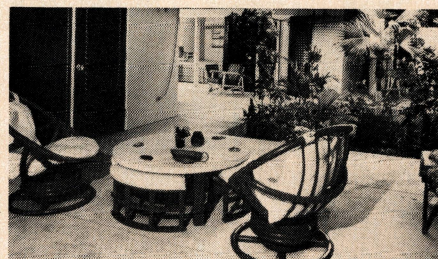
CAYMAN'S NORTH SIDE

Cayman Kai Resort, on the north side of Grand Cayman Island, recently added a new 26 x 12 foot pontoon boat to its fleet of boats for divers. The resort also has a 58 foot boat, the Kai Queen, which can accommodate approximately 25 divers and carries its own 15 cfm 3500 psi Worthington compressor and a cascade system of five 2500 psi storage tanks. A 28 foot Enterprise and an 18 foot Woodson are two other boats among the resort's fleet which are set up specifically for divers.

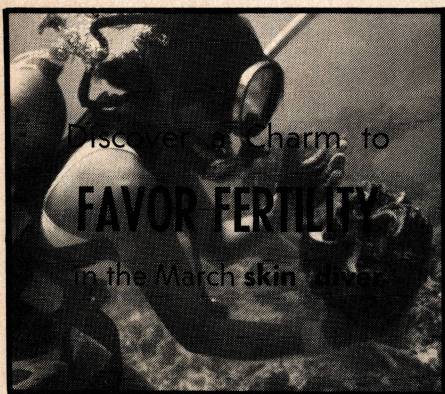


Approximately 500 feet in front of the resort is a natural reef which is great for free diving. On the other side of the reef is a steep coral wall that provides a truly excellent scuba diving area. The resort has 90 tanks and back packs for rent, plus a considerable amount of other scuba equipment including masks, fins, snorkels, regulators, vests, weights, lights and spears. Several of the staff members are experienced divers available to teach and assist the novice and to dive with the experts.

Cayman Kai has 26 sea lodges and 20 privately owned villas which stretch over a mile and a half along the beach. They contain one to four bedrooms, living room, screen patios and complete kitchens for guests wanting to do any or all of their own cooking. Food, beverages and sundries can be purchased at the "Kai-missary," a store located on the premises. The main dining room serves American and island food. "Top of the Kai" serves island drinks and a beach bar is open from 11 a.m.



The Cayman Kai Resort, which is open year round, has a number of packages available for individuals or for groups of divers. For information or reservations, contact: Cayman Kai Resort Ltd., P.O. Box 512, Grand Cayman, B.W.I.; or Hotel Plans Inc., 1301 W. 22nd St., Oak Brook, Ill.



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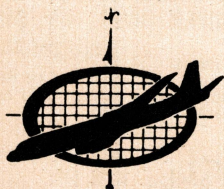
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The International Underwater Explorers Society, as part of its continued effort to offer the best to its guests, has contracted with Flip Schulke to head up four special five-day U/W photographic workshops at the Society's main facilities in Freeport, Grand Bahama, in 1974. Dates of the basic still photography courses are: March 11 to 15; June 3 to 7; and August 26 to 30. The advanced course will be given October 14 to 18.



Cost for each workshop is \$200, which includes all assignment dives, diving equipment (photo equipment, film and processing not included), boats, air, guides, tuition and lectures. It offers the opportunity to work with many kinds of housings, lighting systems and cameras — all taught by this world renowned photojournalist, inventor, writer, educator and underwater photographer.

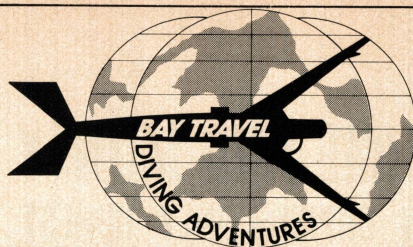
For information and reservations contact: UNEXSO, 1148 N.E. 48th St., Pompano Beach, Florida 33064.

BUCCANEER'S INN SOLD

The Buccaneer's Inn on Cayman Brac (Cayman Islands, British West Indies), was sold to Fosbrac Hotels, Ltd., on August 7, 1973. The new general manager of the Inn is Richard Sander of California. The dive shop manager is Peter Sanford of Cayman Brac. Peter received PADI advanced certification in Miami.

In order to keep pace with their increasing diving business, the Inn recently received a new shipment of Scubapro diving equipment and have plans to expand their tank supply to 55. Group rates for 10 or more divers are available until April 15 at \$40 per day per person. This includes room, three meals per day, tax, gratuity, boat, two tanks per day per person, airport and dock transfers.

For further information contact: Buccaneer's Inn, Cayman Brac, Cayman Islands, British West Indies.



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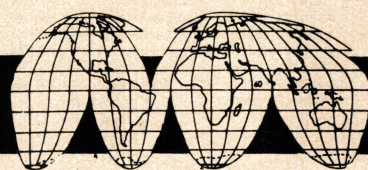
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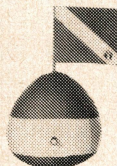
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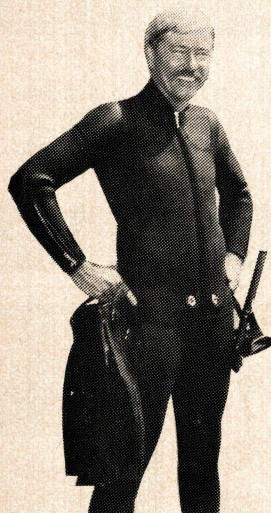
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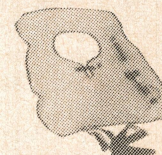
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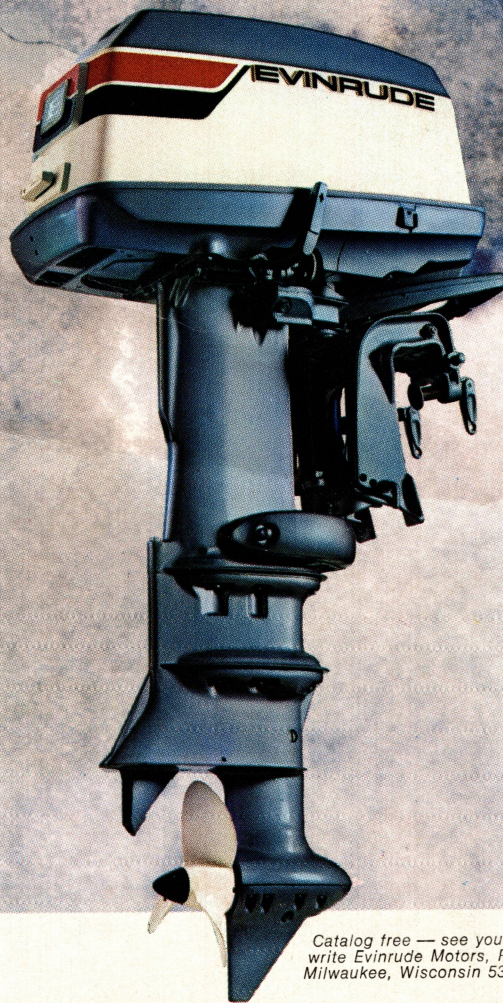
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